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**WEEK 1: LESSON 1**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Explain the relationship between an atom, an element, a molecule, and a compound.

2.Use digital devices to search for information on the relationship between these concepts.

3.Acknowledge the relationship between molecules, atoms, elements, and compounds.

**Key Inquiry Questions:**

- What is the relationship between atoms and molecules?

- What is the relationship between elements and compounds?

**Learning Resources:**

- Digital devices (tablets, computers)

- Active Integrated Science textbook

- Lesson notes

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin by briefly reviewing the previous lesson on mixtures.

- Facilitate a discussion to activate prior knowledge about atoms, elements, and compounds.

- Ask guiding questions, such as: “Can anyone define what an atom is?”

**Lesson Development (30 minutes):**

**Step 1:** Understanding Basic Definitions

- In groups, learners will define the terms "atom", "element", "molecule", and "compound".

- Each group can use their digital devices to search for concise definitions and prepare a short presentation of their findings.

**Step 2:** Relationships Between Concepts

- Groups will discuss and document the relationships among the terms. For example, discuss how molecules are made of atoms and how elements consist solely of one type of atom.

- Each group should come up with visual representations (e.g., concept maps) to show these relationships.

**Step 3:** Exploring Examples

- Groups will use digital devices to find real-world examples of elements and compounds.

- They will then be tasked with identifying the atoms that make up these examples (e.g., H2O, CO2).

**Step 4:** Class Discussion and Sharing

- Each group will share their findings, focusing on one example and explaining how it fits into the definitions and relationships discussed.

- Encourage questions and further discussion among the whole class to reinforce understanding.

**Conclusion (5 minutes):**

- Summarize key points from the lesson: the definitions of atoms, elements, molecules, and compounds, along with their relationships.

- Conduct a quick interactive activity such as a “think-pair-share” where students discuss what they learned with a partner before sharing with the class.

- Preview the next session on mixtures and how they differ from pure substances; prompt students to think about what mixtures they encounter in daily life.

**Extended Activities:**

- Research Assignment: Have students research and create a poster on a specific element, detailing its properties, uses, and how it relates to molecules and compounds.

- Science Journal: Encourage students to keep a science journal where they can illustrate each concept and note any new discoveries about elements and compounds they encounter at home or in nature.

- Interactive Game: Organize a matching game where students pair terms with their correct definitions or examples, which can be done as a class activity or in smaller groups.

**Teacher Self-Evaluation:**

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**WEEK 1: LESSON 2**

**Strand:** Elements, Mixtures, and Compounds

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, students will be able to:**

1.Identify common elements used in science.

2.Assign symbols to selected elements.

3. Prepare charts showing common elements and their symbols.

4.Appreciate the role of common elements in scientific applications.

**Key Inquiry Questions:**

- How are symbols assigned to elements?

- What are some of the common elements used in science?

**Learning Resources:**

- Digital devices

- Lesson notes

- Charts

- Song on the elements

- Marker pens

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Begin by reviewing the previous lesson on mixtures and compounds.

2. Guide students in a discussion about the importance of elements in chemistry, using the lesson notes and other learning resources.

3. Introduce key concepts related to elements and their symbols.

**Lesson Development (30 minutes):**

**Step 1:** Watch and Discuss

- Students will watch a short educational video that highlights common elements used in science.

- After the video, facilitate a group discussion focusing on their observations of the elements featured.

**Step 2:** Research Common Elements

- In small groups, students will use digital devices or printed resources to search for common elements.

- Each group will compile a list of at least five common elements and share them with the class.

**Step 3:** Understanding Symbols

- Guide students in a discussion about how elements are assigned symbols, including examples of some well-known elements (e.g., Hydrogen - H, Oxygen - O).

- Explain the difference between element names and their symbols.

**Step 4:** Create Charts and Flashcards

- Still in their groups, students will select three elements from their earlier list and create charts or flashcards that display the element names and their corresponding symbols.

- Encourage creativity in their presentation, such as including drawings or colorful designs.

**Conclusion (5 minutes):**

- Summarize the key points discussed, reinforcing what makes an element and the significance of symbols.

- Conduct a brief interactive activity, such as a quiz or matching game, where students can match elements to their symbols.

- Prepare students for the next session by providing a preview of upcoming topics or posing questions for reflection, such as "What do you think would happen if certain elements were combined?"

**Extended Activities:**

- Element Investigation Project: Each student can choose one element to research in depth. They should prepare a brief report on its properties, uses, and importance in science, which will be presented in the next class.

-Element Song Creation: Encourage students to create their own songs or raps using the information learned about the elements and their symbols. This will help reinforce their memory and understanding of the elements.

**Teacher Self-Evaluation:**

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**WEEK 1: LESSON 3**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Identify elements in selected compounds.

2.Write the elements in selected compounds on flashcards.

3. Enjoy identifying elements in selected compounds.

**Key Inquiry Question:**

- How can you identify an element in a compound?

**Learning Resources:**

- Lesson notes

- Digital devices (tablets/laptops)

- Flashcards

- Marker pens

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on the basic concepts of elements and compounds.

- Encourage students to share what they remember about elements.

- Guide learners to read and discuss relevant content from the learning resources, emphasizing the understanding of the key concepts.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Selected Compounds

- Present a list of compounds: sodium chloride, water, carbon dioxide, copper oxide, and aluminum oxide on a digital device.

- Explain briefly what each compound is and its significance in everyday life.

**Step 2:** Group Activity - Identifying Elements

- Divide students into small groups.

- Assign each group one or two compounds from the list.

- Instruct groups to research their assigned compound(s) using digital devices to identify the elements they are made of.

**Step 3:** Flashcard Creation

- Once the groups have identified the elements, provide them with flashcards and marker pens.

- Instruct them to write down the names and symbols for each element they found in their assigned compound(s) on the flashcards.

**Step 4:** Class Presentation and Display

- Groups take turns presenting their flashcards to the class, explaining the compounds and the elements they contain.

- Ask students to display their flashcards on a designated board in the classroom.

**Conclusion (5 minutes):**

- Summarize key points discussed during the lesson, revisiting the compounds and the elements they contain.

- Conduct a brief interactive activity, such as a quick quiz or a game about identifying elements from the displayed flashcards.

- Prepare learners for the next session by previewing upcoming topics, such as exploring the differences between elements, compounds, and mixtures.

**Extended Activities:**

- Element Scavenger Hunt: Ask students to find everyday items at home or in their environment that contain specific elements and share their findings with the class in a future session.

- Element Research Project: Allow students to choose an element from the periodic table to research and create a presentation highlighting its properties, common compounds, and uses in daily life.

**Teacher Self-Evaluation:**

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**WEEK 1: LESSON 4**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.State the applications of common elements in society.

2.Discuss the applications of common elements in society.

3.Use digital devices to search for information on the applications of common elements.

4. Acknowledge the importance of common elements in society.

**Key Inquiry Question(s):**

- What are the applications of common elements in society?

**Learning Resources:**

- Lesson notes

- Digital devices (tablets, computers)

- Active Integrated Science textbooks

- Charts or posters depicting common elements and their uses

**Organization of Learning:**

**Introduction (5 minutes):**

- Begin the lesson by briefly reviewing the previous lesson on elements and compounds.

- Introduce the key inquiry question by asking students to share any common elements they know and potential uses.

- Encourage dialogue and guide learners to explore relevant content from the provided learning resources.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming Common Elements

- In small groups, learners will list at least five common elements (e.g., oxygen, hydrogen, carbon, iron, and gold).

- Groups will share their lists on a board or chart paper, promoting collaborative learning.

**Step 2:** Research Applications

- Learners will use digital devices to research the applications of these elements in society (e.g., iron in construction, carbon in fuels, oxygen in respiration).

- Each group will document their findings, ensuring they note down at least two applications for each element.

**Step 3:** Group Discussion

- Each group will discuss their findings within their group and prepare a brief presentation of one common element they researched, highlighting its practical applications.

**Step 4:** Class Presentations

- Each group will present their chosen element and its applications to the class. Encourage questions from peers to foster deeper understanding.

**Conclusion (5 minutes):**

- Summarize the key points covered during the lesson, reinforcing the importance of common elements in everyday life.

- Conduct a brief interactive quiz (e.g., Kahoot or a simple hand-raising Q&A) to test knowledge of the applications discussed.

- Preview the next session's topic, encouraging learners to consider how these elements combine to form compounds.

**Extended Activities:**

- Element Application Poster: Have students create a poster that illustrates one common element and its various applications in society, including images and brief descriptions.

- Elements in the News: Students can choose a current event related to a common element and write a short report on how it impacts society.

- Chemistry Journal: Encourage students to maintain a journal where they can reflect on how common elements affect their daily lives, adding examples they encounter.

**Teacher Self-Evaluation:**

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**WEEK 1: LESSON 5**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.State the applications of common compounds in society.

2. Search the internet for the applications of common compounds in society.

3. Acknowledge the importance of common elements in society.

**Key Inquiry Question:**

- What are the applications of common compounds in society?

**Learning Resources:**

- Digital devices (tablets, computers)

- Lesson notes from the teacher

- Active Integrated Science textbook

- Charts or posters from previous lessons

**Organisation of Learning:**

**Introduction (5 minutes):**

- Quickly review the previous lesson on elements and compounds.

- Ask students a few questions to engage them and refresh their memories about the topics discussed.

- Direct learners to the lesson notes, emphasizing the importance of understanding the applications of compounds.

**Lesson Development (30 minutes):**

**Step 1:** Group Brainstorming

- Divide students into small groups.

- Ask each group to list common compounds they are familiar with, for example, water (H2O), salt (NaCl), or carbon dioxide (CO2).

- Each group will write their list on the board as they brainstorm.

**Step 2:** Research

- Provide each group with digital devices or printed resources.

- Instruct groups to research the applications of the compounds they listed. They should aim to find at least two applications for each compound.

- Encourage students to check reliable sources like educational websites or databases.

**Step 3:** Group Discussion

- Ask each group to discuss their findings amongst themselves.

- Have them identify which applications are most significant to society and why.

- Each group should prepare to present their findings.

**Step 4:** Presentation & Creation

- Allow each group to present their findings to the class, highlighting the most important applications.

- Encourage creativity by asking them to create a simple chart or poster that visually represents the applications of their common compounds.

**Conclusion (5 minutes):**

- Summarize the key points discussed: the importance of common compounds and their real-world applications.

- Conduct a quick interactive activity, such as a quiz or a "Think-Pair-Share" to reinforce the main topics.

- Preview the next session by asking students to think about the environmental impact of these compounds or any new compounds they’d like to learn about.

**Extended Activities:**

- Home Research Assignment: Ask students to choose one common compound used in their homes (like vinegar or bleach) and write a short paragraph about its applications and importance in daily life.

- Create a Compound Dictionary: Each student can create a mini-dictionary of compounds they encounter in the coming weeks, including their formulas, applications, and significance.

- Class Project: Organize a project where students can create visual presentations or models demonstrating the importance of certain compounds and elements in technology, food, or health.

**Teacher Self-Evaluation:**

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**WEEK 2: LESSON 1**

**Strand:** Elements, Mixtures, and Compounds

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1.Explain how compounds are formed in science.

2. Write word equations to represent reactions of selected elements to form compounds.

3.Prepare flashcards showing the word equations of selected elements to form compounds.

4.Enjoy writing word equations to represent reactions of selected elements to form compounds.

**Key Inquiry Question:**

- How are word equations written?

**Learning Resources:**

- Digital devices

- Active Integrated Science

- Lesson notes

- Charts

- Flashcards

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on elements and mixtures.

- Ask students to share their understanding of compounds based on their readings.

- Highlight the importance of understanding how compounds are formed and the role of word equations in representing chemical reactions.

**Lesson Development (30 minutes):**

**Step 1:** Discussion

- Students will break into small groups and discuss how compounds are formed. Each group will share examples of daily compounds they encounter (e.g., water, carbon dioxide, etc.).

- Encourage them to think about the properties of elements that combine to form these compounds.

**Step 2:** Multimedia Learning

- In groups, students will watch a short educational video about writing word equations for reactions. They will take notes on key concepts, and clarify any doubts with their peers.

**Step 3:** Word Equations Practice

- Each group will be assigned different elements (e.g., hydrogen, oxygen, sodium, chlorine).

- They will write word equations for specific reactions, such as the formation of water (hydrogen + oxygen → water) and table salt (sodium + chlorine → sodium chloride).

- Encourage collaboration to ensure every group member participates in writing.

**Step 4:** Flashcard Creation

- Students will create flashcards for each word equation they wrote, including the elements involved and the resulting compound.

- They will display their flashcards on a designated area in the classroom for all students to see and learn from.

**Conclusion (5 minutes):**

- Summarize the key points covered in the lesson, emphasizing how compounds are formed and the significance of word equations.

- Conduct a short interactive quiz using the flashcards. Students can quiz each other or the teacher on the word equations.

- Provide a preview of the next session focusing on the properties of compounds and their importance in everyday life.

**Extended Activities:**

- Group Project: Students can research different compounds and create a poster that details their uses, properties, and the reactions they undergo.

- Home Assignment: Ask students to find three examples of compounds in their household items and write the word equations involved in their formation.

- Interactive Game: Create a classroom game where students must match elements with the corresponding compounds they form to reinforce their knowledge.

**Teacher Self-Evaluation:**

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**WEEK 2: LESSON 2**

**Strand:** Elements, Compounds, and Mixtures

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Identify the information on the packaging labels of commonly consumed substances.

2.Discuss the importance of the information on packaging labels of commonly consumed substances.

3. Create educational messages on the importance of the information on packaging labels of commonly consumed substances.

4. Appreciate the information on packaging labels of commonly consumed substances.

**Key Inquiry Question(s):**

- What type of information is found on the packaging labels?

- What is the importance of the information found on the packaging labels?

**Learning Resources:**

- Lesson notes

- Packaging labels of commonly used substances (e.g., food items, cleaning products)

- Active Integrated Science textbook

- Charts & posters

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin by reviewing the previous lesson on elements and compounds, asking students to recall examples.

- Present the objective of today's lesson, focusing on packaging labels.

- Ask students to brainstorm what types of products they use daily and what information they think might be on the labels.

**Lesson Development (30 minutes):**

**Step 1:** Group Label Collection

- Divide the class into small groups and instruct them to collect packaging labels from commonly consumed substances brought from home or using printed examples provided in class (e.g., food snacks, drinks).

- Give each group a few minutes to share their findings with each other.

**Step 2:** Identifying Information

- Direct students to study the labels they collected.

- Ask them to identify key information such as ingredients, nutritional facts, safety warnings, and expiration dates.

- Facilitate a discussion where groups share the different types of information found on their labels.

**Step 3:** Discussing Importance

- Guide a class discussion on why this information is important: health considerations, dietary choices, safety, and consumer rights.

- Encourage students to think critically about how this information affects their choices and well-being.

**Step 4:** Creating Educational Messages

- In groups, have students create posters that promote awareness of reading packaging labels.

- Posters should include a main message about the importance of label information and include visuals. Once completed, these can be displayed in the classroom or around the school.

**Conclusion (5 minutes):**

- Summarize the key points covered during the lesson, including the types of information on packaging labels and their importance.

- Conduct an interactive quiz or a question-and-answer session to reinforce learning, asking students to share new things they discovered about packaging labels.

- Briefly preview the next lesson, which will explore the differences between elements, compounds, and mixtures in more detail.

**Extended Activities:**

- For a homework assignment, students can choose a product from home and write a short report analyzing the information on its packaging label (e.g., listing ingredients, discussing its nutritional value, safety information).

- Organize a “label scavenger hunt” where students find various products in their homes and categorize them based on the information they find (e.g., nutritious vs. non-nutritious).

**Teacher Self-Evaluation:**

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**WEEK 2: LESSON 3**

**Strand:** Elements, Compounds, and Mixtures

**Sub Strand:** Elements and Compounds

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Attempt assessment questions on the sub-strand: Elements and Compounds.

**Key Inquiry Questions:**

- What are the defining characteristics of elements and compounds?

- How can we differentiate between elements, compounds, and mixtures?

**Learning Resources:**

- Assessment books

- Active Integrated Science textbook

- Teacher's Assessment Questions

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin the lesson by briefly reviewing the last session on mixtures, highlighting their composition and properties.

- Encourage students to read aloud a few paragraphs from the Active Integrated Science textbook regarding elements and compounds. Facilitate a quick discussion around the key concepts to solidify understanding.

**Lesson Development (30 minutes):**

**Step 1:** Identifying Elements

- Explain the concept of elements and provide examples (e.g., hydrogen, oxygen, carbon).

- Students will list different elements they encounter in their daily lives and share them with their partner.

**Step 2:** Understanding Compounds

- Introduce compounds and how they are formed from two or more elements (e.g., water (H₂O), carbon dioxide (CO₂)).

- Ask students to draw a diagram showing one example of a compound and label its components.

**Step 3:** Differences Between Elements and Compounds

- Facilitate a guided comparison of elements and compounds using a Venn diagram.

- Students will work in pairs to fill in the diagram, identifying similarities and differences between elements and compounds.

**Step 4:** Assessment Questions

- Distribute the Teacher's Assessment Questions on elements and compounds.

- Allow students to work individually or in pairs to answer the questions, providing support where necessary.

**Conclusion (5 minutes):**

- Summarize key points: Define elements and compounds, their differences, and importance in chemistry.

- Conduct a brief interactive activity, such as a quick-fire quiz asking questions about elements and compounds to reinforce learning.

- Preview the next session’s topics, hinting at the relationship between compounds and mixtures to spark curiosity.

**Extended Activities:**

- Research Project: Have students select an element from the periodic table to research. They can create a poster or a digital presentation that includes its properties, uses, and interesting facts.

- Classification Game: Create a set of cards with names and formulas of various elements and compounds. Conduct a classroom activity where students classify the cards into elements, compounds, or mixtures, fostering teamwork and critical thinking.

**Teacher Self-Evaluation:**

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**WEEK 2: LESSON 4**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Explain the kinetic theory of matter.

2.Conduct experiments to demonstrate diffusion in liquids and gases to illustrate kinetic theory of matter.

3.Acknowledge the kinetic theory of matter in particles.

**Key Inquiry Question:**

- What does the kinetic theory of matter state?

**Learning Resources:**

- Lesson notes

- Digital devices (tablets/laptops)

- Active Integrated Science textbook

- Water, ink or potassium permanganate

- Beakers

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on matter and its states.

- Guide learners to read and discuss relevant content from the learning resources, focusing on key concepts of the kinetic theory of matter.

**Lesson Development (30 minutes):**

**Step 1:** Research and Discussion

- In groups, learners will search the internet for information about the kinetic theory of matter.

- Encourage learners to take notes and prepare a short presentation on their findings. Key topics to cover may include the movement of particles and how temperature affects particle motion.

**Step 2:** Presentation

- Each group will present their findings to the class.

- Classmates can ask questions for clarification to reinforce understanding.

- Teacher will provide insights and add relevant lessons to solidify concepts during presentations.

**Step 3:** Experiment Setup

- Distribute materials needed for the diffusion experiments (water, ink or potassium permanganate, beakers).

- Explain the procedure for the experiment: adding a drop of ink or potassium permanganate to water and observing diffusion over time.

**Step 4:** Conducting Experiments and Observations

- Learners will conduct the diffusion experiment.

- They will observe and record the changes in the mixture over time.

- After the experiment, engage learners in discussing their observations and how they relate to kinetic theory.

**Conclusion (5 minutes):**

- Summarize the key points discussed during the lesson, emphasizing how the kinetic theory relates to the movement and behavior of particles.

- Conduct a brief interactive activity, such as a quick quiz or think-pair-share, to reinforce the main topics. Ask learners to share one thing they learned about the kinetic theory of matter.

- Prepare learners for the next session by previewing upcoming topics, such as changes in states of matter.

**Extended Activities:**

- Research Project: Ask students to choose a specific substance and research how its kinetic energy changes with temperature. They can present their findings in the next class.

- Create a Kinetic Theory Model: Have students create a visual model (drawing or digital presentation) that illustrates how particle movement varies in solids, liquids, and gases.

- Home Experiment: Encourage students to try a simple diffusion experiment at home (e.g., adding food coloring to a glass of water) and report their findings in the next class.

**Teacher Self-Evaluation:**

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**WEEK 2: LESSON 5**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1.Identify the three states of matter.

2. State the properties of solids.

3.Conduct simple experiments to demonstrate the characteristics of solids.

4. Acknowledge the properties of solids as a state of matter.

**Key Inquiry Question(s):**

What are the properties of solids?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Stones, wood (for experiments)

- Beaker with water

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson by asking students about what they learned regarding mixtures and compounds.

- Guide learners to read and discuss relevant content from the learning resources, emphasizing the understanding of solids as a state of matter.

**Lesson Development (30 minutes):**

**Step 1:** Identify the States of Matter

- In groups, have students list the three states of matter: solid, liquid, gas.

- Prompt a discussion on how each state appears in everyday life, ensuring they understand the distinct properties.

**Step 2:** Research Properties of Solids

- Allow groups to search print or digital resources (including the Active Integrated Science textbook) for the specific properties of solids (e.g., definite shape, definite volume, rigidity).

- Each group shares at least two properties found in their research.

**Step 3:** Conduct Experiments

- Provide each group with materials (stones, wood, beaker with water).

- Instruct them to perform simple experiments to observe solid properties, such as:

- Testing weight (using a balance scale if available).

- Testing durability (by pressing, dropping, or scratching).

- Observing how solids do not change shape in the beaker of water.

**Step 4:** Record Observations

- Groups summarize their findings and record their observations regarding the behavior of solids during experiments.

- Facilitate a brief discussion to compare the results of each group.

**Conclusion (5 minutes):**

- Summarize key points regarding the properties of solids and how they differ from other states of matter.

- Conduct an interactive activity, such as a quick quiz or a “true or false” game, to reinforce the main topics.

- Prepare learners for the next session with a preview of upcoming topics, such as the transition between states of matter (melting, freezing, etc.) and pose questions to consider, such as "Can a solid change into a liquid?"

**Extended Activities:**

- Have students create a poster or digital presentation illustrating the properties of solids with real-world examples and images.

- Assign students to find an article about a material that undergoes a change between solid and liquid states, such as ice or wax, and present it to the class in the next lesson.

- Encourage students to collect different solid materials from home or nature, categorize them based on their properties, and bring them in for a hands-on exploration in the next class.

**Teacher Self-Evaluation:**

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**WEEK 3: LESSON 1**

**Strand:** Elements, Mixtures, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1.State the properties of liquids as a state of matter.

2.Conduct simple activities to demonstrate the properties of liquids.

3. Acknowledge the properties of liquids.

**Key Inquiry Question(s):**

- What are the characteristics of liquids as a state of matter?

**Learning Resources:**

- Lesson Notes

- Digital devices (for research)

- Water

- Active Integrated Science textbook

- Beakers, bottles, graduated cylinder, volumetric flasks

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the key concepts from the previous lesson (e.g., states of matter).

- Pose the key inquiry question to stimulate discussion: “What do you think makes a liquid different from a solid or a gas?”

- Encourage learners to share their ideas and relate them back to previous knowledge.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorm Properties of Liquids

- In small groups, learners brainstorm properties of liquids (e.g., no definite shape, takes the shape of the container, has a definite volume).

- Each group shares their ideas with the class, and a teacher-led discussion reinforces their findings.

**Step 2:** Research Properties of Liquids

- Groups use digital devices to research additional properties of liquids, such as viscosity, density, and surface tension.

- Learners record interesting facts and prepare to present their findings to the class.

**Step 3:** Conduct Hands-On Activities

- Distribute materials (beakers, graduated cylinders, water) to each group and guide them to conduct simple activities demonstrating properties of liquids.

- Examples: measure and compare the volume of water in various containers, observe pouring and flow of liquids.

- Ask each group to take notes on their observations.

**Step 4:** Share Observations and Discuss

- Groups present their findings and observations from the activities to the class.

- Facilitate a discussion on how the observed characteristics align with the properties discussed earlier in the lesson.

**Conclusion (5 minutes):**

- Summarize the key points learned about the properties of liquids.

- Reinforce the learning objectives achieved during the lesson.

- Conduct a quick interactive quiz or activity (e.g., a true/false game about the properties of liquids) to reinforce the main topics.

- Preview upcoming topics related to mixtures or physical changes to prepare learners for the next session.

**Extended Activities:**

- Explore Density: Have learners experiment with mixing different liquids (e.g., oil and water) to explore concepts of density and immiscibility.

- Create Density Bottles: Learners can create density columns at home using syrup, water, and vegetable oil, observing how various liquids interact.

- Research Project: Assign a research project on a specific liquid (like mercury or alcohol), including its properties, uses, and safety concerns.

**Teacher Self-Evaluation:**

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**WEEK 3: LESSON 2**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand**: Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1. Identify the properties of gases as a state of matter.

2.Conduct activities to demonstrate the properties of gases.

3. Acknowledge the properties of gases.

**Key Inquiry Question(s):**

- What are the properties of gases?

**Learning Resources:**

- Lesson notes

- Active Integrated Science textbook

- Balloons

- Syringes

- Air pumps

- Digital devices

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on states of matter, focusing on solids and liquids.

- Ask students guiding questions to engage them, such as: "What do you think makes gases different from liquids and solids?"

- Allow learners to read and discuss key points from lesson notes and the Active Integrated Science textbook, emphasizing gases.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming

- Divide learners into small groups (4-5 students each).

- Ask groups to brainstorm and write down all the properties of gases they can think of (e.g., expandability, compressibility, diffusibility, low density).

- Each group will present their findings to the class for discussion.

**Step 2:** Group Discussion

- Facilitate a whole-class discussion based on the properties listed by the groups.

- Introduce and clarify any scientific terms as needed.

- Encourage students to provide examples from their daily lives related to gas properties (e.g., why a balloon pops when squeezed).

**Step 3:** Hands-On Activity

- Distribute balloons, syringes, and air pumps to each group.

- Instruct groups to conduct a hands-on activity:

- Activity 1: Use balloons to illustrate gas expansion by inflating them and discussing what happens as they fill with air.

- Activity 2: Use syringes to demonstrate compressibility by sucking the air out of the syringe and noting what happens to the volume.

- Activity 3: (Optional) Use air pumps to explore diffusion by showing how air moves from one area of higher pressure to lower pressure.

- After the activities, each group will record their observations.

**Step 4:** Share Observations

- Have each group share their observations and experiences from the activities with the class.

- Encourage questions and reflections on how these experiments relate to the properties discussed initially.

**Conclusion (5 minutes):**

- Summarize key points on the properties of gases: expandability, compressibility, low density, and diffusibility.

- Reinforce the learning objectives achieved during the lesson.

- Conduct a brief interactive quiz using a digital device to test understanding of the properties discussed.

- Prepare learners for the next session by previewing the topic of chemical changes in matter and pose questions such as: "How do gases behave when involved in chemical reactions?"

**Extended Activities:**

- Homework Assignments: Research and write a short report on everyday applications of gases (e.g., in cooking, industry, and weather).

- Class Experiment: Plan a simple experiment where students can design a way to observe gas behavior (e.g., creating fizzy reactions with baking soda and vinegar).

- Gas Properties Poster: Create a visual poster displaying the properties of gases, including illustrations and real-life examples.

**Teacher Self-Evaluation:**

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**WEEK 3: LESSON 3**

**Strand:** Elements, Mixtures, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Define the term "Heating Curve" in science.

2. Discuss the stages of a heating curve in science.

3. Search the internet for clips on the heating curves of different experiments.

4. Acknowledge the stages involved in a heating curve.

**Key Inquiry Questions:**

- What is a heating curve?

- What stages are involved in heating curves?

**Learning Resources:**

- Digital Devices (Tablets, Laptops)

- Lesson Notes

- Video Clips on heating curves

- Pictures of heating curves

- Active Integrated Science Textbook

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review what was learned in the previous lesson about physical and chemical changes.

- Guide learners to read and discuss the relevant content from the learning resources, emphasizing definitions and key concepts related to heating curves.

**Lesson Development (30 minutes):**

**Step 1:** Define Heating Curve

- In small groups, learners will brainstorm the meaning of "heating curve."

- Each group will present their definition and ideas to the class.

**Step 2:** Study Pictures

- Learners will look at provided pictures of different heating curves.

- In groups, they will identify and discuss key features (e.g., plateaus, temperature changes).

**Step 3:** Explore Digital Clips

- Using digital devices, learners will search for and watch clips related to heating curves for different substances (e.g., water, ice).

- They will take notes on how the clips illustrate the process.

**Step 4:** Discuss Stages

- Class discussion to go over the main stages of a heating curve (e.g., melting, boiling).

- Encourage students to relate their findings from the clips back to the stages identified in the heating curve.

**Conclusion (5 minutes):**

- Summarize the key points about heating curves and the learning objectives achieved during the lesson.

- Conduct a brief interactive activity where students categorize different phases of matter based on a heating curve graph.

- Prepare learners for the next session by giving a preview of what will be covered next (e.g., phase changes and energy transfer).

**Extended Activities:**

- Create a Heating Curve Poster: Students can create a poster that illustrates a heating curve, identifying each stage with images and short descriptions.

- Conduct a Simple Experiment: Have learners conduct a simple experiment (e.g., melting ice) and record the temperature changes at various stages, creating their own heating curve graphs.

- Research Assignment: Assign students to research the heating curves of different materials (e.g., metals, organic substances) and present their findings to the class.

**Teacher Self-Evaluation:**

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**WEEK 3: LESSON 4**

**Strand:** Elements, Mixtures, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners will be able to:**

1. Differentiate between melting and boiling points.

2. Explain the effects of impurities on boiling and melting points.

3. Conduct experiments to determine the melting and boiling points of substances and the effects of impurities.

4. Acknowledge how impurities affect boiling and melting points of substances.

**Key Inquiry Questions:**

1. What is the effect of impurities on boiling and melting points of substances?

2. What is the difference between melting and boiling points of substances?

**Learning Resources:**

- Active Integrated Science, pages 66-68

- Wax

- Distilled water

- Thermometer

- Bunsen burner

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin with a brief review of the previous lesson on states of matter.

- Ask students to summarize key points on melting and boiling.

- Introduce the focus for today's lesson: Melting and boiling points and the effect of impurities.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Melting and Boiling Points

- In groups, students will discuss and define melting point and boiling point.

- Share definitions with the class and clarify any misunderstandings.

- Write key terms on the board.

**Step 2:** Experiment Setup

- Introduce the experiment: How to determine the melting point and boiling point of wax and distilled water.

- Demonstrate how to safely use the Bunsen burner and thermometer.

- Have students follow guided instructions to set up their experiments with pure substances.

**Step 3:** Conducting the Experiment

- Guide students as they observe and record the melting and boiling points of the pure wax and distilled water.

- Discuss what they observe regarding changes in state.

**Step 4:** Impurities and Their Effects

- Introduce a new variable: adding impurities to wax and observing the changes in melting and boiling points.

- Allow students to add the impurities and record their observations.

- Facilitate a discussion on how the results changed with impurities added.

**Conclusion (5 minutes):**

- Summarize the key points from the lesson: definitions of melting and boiling points, the setup and observations from experiments, and the effects of impurities.

- Conduct a brief interactive quiz or ask students to state one new thing they learned today.

- Preview the next lesson: Exploring different methods of separating mixtures.

**Extended Activities:**

- Research Project: Students can research different substances and their melting/boiling points and present their findings in the next class.

- Practical Application: Encourage students to think of real-world implications of impurities in everyday liquids (like cooking or food preservation) and prepare a brief presentation on their implications.

- Additional Experiments: Set up experiments to determine boiling points of various mixtures, such as saltwater versus pure water.

**Teacher Self-Evaluation:**

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**WEEK 3: LESSON 5**

**Strand:** Elements, Mixtures and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Define the term "physical change" in substances.

2. State the properties of physical change in substances.

3. Conduct simple activities to demonstrate the properties of physical change.

4. Express enjoyment in conducting activities on physical change.

**Key Inquiry Questions:**

- What is a physical change?

- How can you demonstrate the properties of physical change in a substance?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Candle wax

- Nail

- Bunsen burner

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on elements, mixtures, and compounds.

- Encourage learners to read and discuss relevant content from the learning resources with a focus on the key concepts of physical changes.

**Lesson Development (30 minutes):**

**Step 1:** Definition of Physical Change

- In groups, learners will discuss and collaboratively define "physical change." Each group will share their definition with the class.

- Questions for discussion:

- What is a physical change?

- Can you give examples from real life?

**Step 2:** Properties of Physical Change

- Groups will brainstorm and list the properties of physical change in substances.

- Properties to include: reversible process, no new substance formed, changes in state (solid, liquid, gas).

- Each group will present their findings to the class.

**Step 3:** Conducting Experiments

- Using candle wax and a Bunsen burner, groups will melt the wax and quickly observe the changes in its state. Students will take notes on their observations.

- Ask them to think critically:

- What changes did you observe?

- Is any new substance formed?

**Step 4:** Explore Other Examples

- Groups will list other familiar substances that can undergo physical changes (e.g., melting ice, dissolving sugar in water).

- Encourage each group to share one additional example with the class.

**Conclusion (5 minutes):**

- Summarize the key points discussed: the definition and properties of physical change, along with the activities conducted.

- Conduct a brief interactive quiz where students answer a few questions regarding physical changes to reinforce the main topics learned.

- Preview the next lesson topic on chemical changes, encouraging students to think of examples of chemical changes they encounter in daily life.

**Extended Activities:**

- Home Experiment: Students can perform a simple home experiment, such as melting chocolate or ice and recording their observations about physical changes.

- Research Assignment: Have students research common physical changes in nature (like weathering of rocks) and present their findings in the next class.

**Teacher Self-Evaluation:**

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**WEEK 4: LESSON 1**

**Strand:** Elements, Mixtures, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners will be able to:**

1. Carry out a simple heating curve experiment using candle wax.

2. Draw a heating curve based on the experiment conducted.

3. Acknowledge the importance of heating curves for substances.

**Key Inquiry Question:**

- What is the importance of heating curves in science?

**Learning Resources:**

- Candle wax

- Stopwatches

- Thermometers

- Laboratory setup

- Experiment procedure papers

- Graph books

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on physical and chemical changes.

- Guide learners to read and discuss relevant content from the experiment procedure papers, emphasizing the concept of heating curves and their significance in understanding the behavior of substances.

**Lesson Development (30 minutes):**

**Step 1:** Group Formation and Task Assignment

- Divide the class into small groups.

- Assign roles within each group (e.g., timekeeper, recorder, observer, and presenter).

- Distribute the experiment procedure papers and clarify any doubts about the instructions.

**Step 2:** Conducting the Heating Curve Experiment

- Instruct each group to heat the candle wax in a controlled way while using stopwatches and thermometers to record temperature changes over time.

- Remind learners to observe and note down physical changes such as melting and boiling points.

**Step 3:** Drawing the Heating Curve

- Once temperature data is collected, groups will use graph books to plot the heating curve, indicating temperature on the Y-axis and time on the X-axis.

- Encourage them to label key points such as melting point and boiling point clearly.

**Step 4:** Group Presentations

- Each group will present their heating curve to the class, highlighting their observations and explaining the significance of the points on their graphs.

- Facilitate a group discussion about differences and similarities among their results.

**Conclusion (5 minutes):**

- Summarize the key points discussed during the lesson, including the steps of the heating curve and its importance in science.

- Conduct a brief interactive activity, such as a question-and-answer session, to reinforce understanding.

- Preview upcoming topics, such as phase changes and energy transfer, and encourage students to consider questions about how these concepts relate to the heating curve.

**Extended Activities:**

- Research Assignment: Have students research how heating curves apply in real-life situations (e.g., cooking, weather changes) and present their findings in the next class.

- Creative Project: Ask students to create a visual presentation (e.g., poster or slideshow) on different materials' heating and cooling curves to display in the classroom.

**Teacher Self-Evaluation:**

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**WEEK 4: LESSON 2**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Define the term chemical change.

2.State the properties of chemical change.

3.Conduct a simple experiment to demonstrate the properties of chemical change.

4.Acknowledge the properties of chemical change in substances.

**Key Inquiry Question:**

- What are the properties of chemical change in substances?

**Learning Resources:**

- Anhydrous Copper (II) Sulphate

- Rusted nail

- Active Integrated Science workbook

- Lesson notes

- Digital devices for research

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin the lesson with a quick review of the previous concepts learned about mixtures, elements, and compounds.

- Ask students to discuss in pairs what they remember.

- Guide learners to read a selected passage from their Active Integrated Science workbook that introduces chemical change and encourages discussion about key concepts.

**Lesson Development (30 minutes):**

**Step 1:** Define Chemical Change

- In groups of four, students will discuss and create a group poster defining what a chemical change is. They should consider everyday examples and use simple definitions.

- Groups will present their definitions to the class.

**Step 2:** Properties of Chemical Change

- Each group will list and share at least three properties of chemical change (such as color change, gas production, and temperature change) on a whiteboard.

- As a class, compile a master list and discuss each property, providing examples where possible.

**Step 3:** Demonstration Experiment

- Conduct a live demonstration using anhydrous copper (II) sulfate and water to show a chemical change (e.g., heat it with water until it forms blue hydrated copper sulfate).

- Encourage students to take notes and observe the changes that occur in terms of color, temperature, and state.

**Step 4:** Reflection Activity

- Students will individually write down at least three substances they know that undergo a chemical change, along with a brief explanation of how they change.

- Encourage them to think about chemical changes in rusting and combustion.

**Conclusion (5 minutes):**

- Summarize the key points discussed in the lesson: the definition of chemical change and its properties.

- Engage in a brief interactive activity, such as a "properties of change quiz" where students can volunteer answers or write responses on digital devices for immediate feedback.

- Preview the next session's topics on physical changes and how they differ from chemical changes, prompting students to think about what they will learn.

**Extended Activities:**

- Home Experiment: Ask students to conduct a simple home experiment (such as baking soda and vinegar reaction) and document the changes they observe, focusing on identifying properties of chemical changes.

- Research Assignment: Assign students to research a specific chemical reaction that occurs in everyday life (like browning of apples or the rusting of iron) and prepare a short presentation on it for the next class.

- Creative Project: Have students create a comic strip or storyboard illustrating a particular chemical change, detailing what happens before, during, and after the change.

**Teacher Self-Evaluation:**

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**WEEK 4: LESSON 3**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1.State the differences between physical and chemical changes.

2.Discuss the differences between physical and chemical changes.

3. Prepare charts showing the differences between physical and chemical changes.

4. Acknowledge the difference between physical and chemical changes in substances.

**Key Inquiry Question:**

- What is the difference between physical and chemical changes in substances?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Pre-prepared charts/posters

- Marker pens

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on mixtures and compounds to connect knowledge.

- Guide learners to read and discuss relevant content from their textbooks, particularly focusing on definitions and examples of physical and chemical changes.

**Lesson Development (30 minutes):**

**Step 1:** Identify the Differences

- In small groups, students brainstorm and list examples of physical changes (e.g., melting ice, tearing paper) and chemical changes (e.g., rusting iron, burning wood).

- Facilitate a brief discussion where each group shares their examples.

**Step 2:** Define Key Concepts

- Students work together to define what makes a change physical or chemical. Teacher circulates to offer guidance and ensure clarity.

- Encourage students to reflect on the nature of these changes and to think about energy, reversibility, and the identity of the substance.

**Step 3:** Prepare Charts/Posters

- Students will use large sheets of paper or poster boards to create a chart contrasting physical and chemical changes.

- Include aspects like definitions, examples, characteristics, and key differences. Instruct them to be creative in how they present the information (e.g., drawings, diagrams).

**Step 4:** Display and Share

- Each group displays their chart around the classroom.

- Conduct a gallery walk where students can view other groups' work and provide feedback or ask questions.

**Conclusion (5 minutes):**

- Summarize the key points discussed in class, reinforcing the definitions and examples of physical vs. chemical changes.

- Conduct a quick interactive activity: Ask students to identify if a set of scenarios presented on the board are physical or chemical changes.

- Preview the next lesson: "Exploring States of Matter and Their Changes" and encourage students to think about how matter changes in their daily experiences.

**Extended Activities:**

- Home Experiment: Have students conduct a simple physical or chemical change at home (e.g., baking soda and vinegar reaction for chemical change, melting chocolates for physical change) and report back their observations to the class.

- Research Project: Students could research a real-world application of chemical changes, such as cooking or rusting, and present their findings in the next class.

**Teacher Self-Evaluation:**

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**WEEK 4: LESSON 4**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1.Identify the changes of state of matter in science.

2.Describe the different changes of state of matter in science.

3.Draw a diagram showing the changes of state of matter.

4.Acknowledge the different changes of matter.

**Key Inquiry Question(s):**

- What changes does matter undergo?

**Learning Resources:**

- Active Integrated Science

- Lesson notes

- Internet

- Digital devices

- Resource books

- Charts

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson: Briefly revisit key points from the last class, focusing on matter and its properties.

- Guide learners: Have students read selected excerpts from learning resources related to changes of state, discussing initial thoughts in pairs.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming

- In groups, learners brainstorm and list different changes of states of matter (solid, liquid, gas).

- Encourage students to think of real-life examples related to each change (e.g., melting ice for solid to liquid).

**Step 2:** Research

- Provide learners with digital devices to research specific changes of state of matter.

- Each group finds definitions and examples of processes like evaporation, condensation, freezing, and melting.

**Step 3:** Explanation and Discussion

- Groups share their findings with the class. Discuss the importance of each change and how it affects matter.

- Highlight how certain materials, like water, exhibit all three states and their changes.

**Step 4:** Diagram Creation

- Learners draw and label a diagram showing the changes of state of matter (e.g., solid to liquid to gas and vice versa) on charts.

- Display these charts around the classroom to encourage reference during future lessons.

**Conclusion (5 minutes):**

- Summarize the key points: Review what changed in states of matter, mentioning the terms observed (melting, freezing, condensation, evaporation).

- Interactive activity: Play a quick game where students match terms to their definitions on the board.

- Preview the next session: Inform students that they will explore physical and chemical changes in more detail and lead them to consider questions such as "How do physical changes differ from chemical changes?"

**Extended Activities:**

- Home Experiment: Assign students to conduct a simple home experiment to observe a change of state, like making ice cubes and observing their melting process. They should document their observations in a journal and reflect on the changes they witness.

- Research Project: Encourage learners to research a specific substance's states and changes, preparing a short presentation for the class.

- Art Integration: Invite students to create a visual art piece that represents the three states of matter and their changes, incorporating elements from their research.

**Teacher Self-Evaluation:**

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**WEEK 4: LESSON 5**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Outline the applications of changes in the state of matter in daily life.

2. Conduct an internet search on these applications.

3. Appreciate how the different changes in the state of matter impact our daily lives.

**Key Inquiry Question:**

- What are the applications of the different changes of state of matter?

**Learning Resources:**

- Digital devices (tablets/laptops)

- Lesson notes

- Active Integrated Science textbook

- Internet access

**Organization of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on the states of matter and types of changes (physical and chemical).

- Ask students to share any examples of changes of state (e.g., melting, freezing, evaporating).

- Guide learners to read and discuss relevant content from the lesson notes, emphasizing key concepts about states of matter.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming Session

- In small groups, students brainstorm examples of where they see changes in state in their daily lives (e.g., ice melting into water, boiling water turning into steam). Have each group create a quick list on a piece of paper.

**Step 2:** Research Activity

- Using digital devices, students search for at least three specific applications of changes in state of matter (e.g., cooking, refrigeration, weather phenomena). Encourage them to find diverse examples and consider how these changes affect uses in technology or the environment.

**Step 3:** Group Discussion

- Each group discusses their findings from the research, elaborating on how these applications relate to the change of state (e.g., how boiling water produces steam that cooks food or powers engines).

**Step 4:** Class Presentation

- Each group presents one application they found during their research. Encourage them to explain the change of state involved and its significance in daily life.

**Conclusion (5 minutes):**

- Summarize the key points discussed in the lesson regarding the applications of changes in state matter.

- Reinforce the connections to everyday life through interactive questions—for instance, “What happens when you leave a glass of ice water on the table?”

- Prepare learners for the next session by previewing the topic of physical vs. chemical changes, asking guiding questions such as, “Can you think of an example of each in your home?”

**Extended Activities:**

- Create a Poster: Students can create a poster illustrating different changes of state and their applications. They can hang these posters in the classroom.

- Observation Diary: Ask students to keep a diary for a week, noting any observations of changes in state of matter they encounter in their daily routines, then share their insights in the next class.

- Experimentation Day: Plan a hands-on experiment for the next lesson where students can observe changes of state firsthand, such as freezing water or boiling it, and recording their observations.

**Teacher Self-Evaluation:**

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**WEEK 5: LESSON 1**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Physical and Chemical Changes

**Specific Learning Outcomes:**

**-By the end of the lesson, the learner should be able to**

1.Attempt assessment questions on the sub-strand.

**Key Inquiry Question(s):**

- How do physical and chemical changes affect the properties of substances?

- What are some examples of everyday physical and chemical changes that can be observed?

**Learning Resources:**

- Assessment books

- Active Integrated Science

- Teacher's Assessment Questions

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson focusing on mixtures, elements, and compounds.

- Engage learners in a brief discussion about what they remember from the last lesson, encouraging them to share examples of physical and chemical changes.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Physical and Chemical Changes

- Define and distinguish between physical changes (e.g., melting, freezing) and chemical changes (e.g., rusting, burning).

- Ask students to provide examples of each type of change from their everyday lives.

**Step 2:** Explore Characteristics

- Discuss the characteristics of physical changes (no new substances formed) and chemical changes (new substances formed).

- Highlight indicators of chemical changes (e.g., color change, gas production).

**Step 3:** Group Activity

- In pairs, have learners complete a Venn diagram comparing and contrasting physical and chemical changes. Encourage them to provide at least three examples for each category.

**Step 4:** Assessment Questions

- Distribute assessment questions from the learning resources.

- Guide students to work individually or in pairs to answer the questions, applying their understanding of the concepts covered in the lesson.

**Conclusion (5 minutes):**

- Summarize the key points: differences between physical and chemical changes, examples, and characteristics.

- Conduct a quick interactive activity, such as a think-pair-share, where students share one physical change and one chemical change they observed recently.

- Prepare learners for the next session by previewing the topic of mixtures and their separation techniques, suggesting they consider where we see these concepts in real life.

**Extended Activities:**

- Experiment at Home: Encourage students to conduct a simple experiment at home (with parental supervision), such as mixing vinegar and baking soda, to observe a chemical change. They should document their observations in a science journal.

- Research Project: Students can research a specific physical or chemical change (e.g., how rust forms) and create a poster or presentation to share with the class.

**Teacher Self-Evaluation:**

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**WEEK 5: LESSON 2**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Identify the components of the fire triangle in the spread of fire.

2. Explain the role of each component in the fire triangle.

3.Draw a fire triangle and indicate its components.

4. Acknowledge the significance of each component of the fire triangle concerning fire spread.

**Key Inquiry Questions:**

- What are the components of a fire triangle?

- What is the role of each component in the fire triangle?

**Learning Resources:**

- Digital devices

- Short clip on the fire triangle

- Lesson notes

- Active Integrated Science textbook

- Charts for drawing

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin with a quick review of the previous lesson, focusing on the concept of mixtures, elements, and compounds.

- Use guided questions to engage learners, such as: "What do you know about fire and how it spreads?"

- Introduce the topic of the fire triangle, emphasizing its importance in understanding fire safety.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to the Fire Triangle

- Show a short clip explaining the fire triangle (fuel, heat, and oxygen).

- Discuss each component briefly, asking students probing questions to activate prior knowledge (e.g., “What happens if we take away one of these components?”).

**Step 2:** Group Research Activity

- Divide learners into small groups.

- Assign each group to use digital devices or textbooks to find detailed information about each component of the fire triangle.

- Ask them to discuss and list how each component contributes to the spread of fire.

**Step 3:** Drawing and Labeling the Fire Triangle

- Provide charts or paper for each group.

- Instruct them to draw a fire triangle, labeling each of the three components (fuel, heat, and oxygen) clearly.

- Encourage creativity in their designs, reminding them to include examples of each component (e.g., types of fuels).

**Step 4:** Presentation and Discussion

- Have each group share their drawings with the class, explaining the components and their roles in the fire triangle.

- Facilitate a discussion, prompting other students to ask questions or provide additional insights.

**Conclusion (5 minutes):**

- Summarize the key points covered: the three components of the fire triangle and their significance.

- Conduct a quick interactive quiz where students shout out answers regarding components and their functions.

- Preview the next session's focus, which may include practical applications of fire safety measures.

**Extended Activities:**

- Fire Safety Poster Creation: Ask students to create informative posters about fire safety, highlighting the fire triangle and safety tips to prevent fire outbreaks.

- Real-life Application: Challenge students to identify instances in their environment where they observe the principles of the fire triangle and discuss how removing one component could influence fire spread.

- Home Fire Safety Checklist: Instruct students to develop a fire safety checklist that their families can use in the home, focusing on eliminating fuel and ensuring safe heat sources.

**Teacher Self-Evaluation:**

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**WEEK 5: LESSON 3**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Outline ways of controlling different classes of fires.

2. Describe different methods of fire control.

3. Use digital devices to search for information on fire control measures.

4. Appreciate the importance of controlling different classes of fire.

**Key Inquiry Question(s):**

- How can we control the different classes of fire?

**Learning Resources:**

- Active Integrated Science

- Lesson notes

- Digital devices (tablets/laptops)

- Video clips on fire control measures

**Organization of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on mixtures and compounds.

- Engage learners by asking what they recall about fires and their different classes.

- Introduce the topic by discussing the importance of controlling fires.

**Lesson Development (30 minutes):**

**Step 1:** Group Formation & Exploration

- Divide students into small groups.

- Each group discusses what they know about different classes of fires (A, B, C, D, and K).

- Direct them to use digital devices or print media to start researching fire control measures related to these classes.

**Step 2:** Identifying Control Measures

- Each group lists the control methods they find for each class of fire (e.g., water, foam, carbon dioxide, dry powder, etc.).

- Encourage learners to think critically about why certain methods are used for specific classes of fire.

**Step 3:** Group Discussion

- Each group shares their findings with the class.

- Facilitate a class discussion to compile and compare the control measures identified by different groups.

**Step 4:** Video Analysis

- Show a short video clip that demonstrates fire control techniques in action.

- After the video, prompt a discussion on what students observed and how the techniques apply to what they researched.

**Conclusion (5 minutes):**

- Summarize the key points covered regarding the classification of fires and control measures.

- Conduct a quick interactive activity, such as a quiz or a matching game, to reinforce the main topics.

- Preview the next session, hinting at a focus on fire safety and prevention strategies.

**Extended Activities:**

- Research Project: Have students select a specific class of fire and create a presentation on its characteristics, control methods, and real-life examples of incidents.

- Role-Play Activity: Students can simulate a fire emergency and role-play as firefighters to discuss control methods they would use.

- Field Trip: Organize a visit to a local fire station to learn directly from firefighters about fire safety and control measures.

**Teacher Self-Evaluation:**

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**WEEK 5: LESSON 4**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Describe how to use a fire extinguisher in case of a fire outbreak.

2. Search the internet for clips on how to use a fire extinguisher.

3.Practice controlling fire using a fire extinguisher.

4.Develop a desire to know how to handle and use a fire extinguisher in case of a fire outbreak.

**Key Inquiry Question(s):**

- How do you handle a fire extinguisher in case of a fire outbreak?

**Learning Resources:**

- Digital devices (tablets or computers)

- Video clips on using a fire extinguisher

- Fire extinguisher (practice unit)

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Review the Previous Lesson:

- Briefly discuss what students learned about the different types of fire (for example, grease, electrical, etc.).

2. Guide Discussion:

- Introduce the day's topic by asking students how they might react in a fire emergency.

- Highlight the importance of knowing how to properly use a fire extinguisher.

**Lesson Development (30 minutes):**

**Step 1:** Research

- Divide students into small groups and assign each group to search the internet for video clips demonstrating how to use a fire extinguisher.

- Encourage them to note down key steps shown in the videos.

**Step 2:** Explanation

- Each group presents the steps they found for using a fire extinguisher.

- Write these steps on the board as they are shared to create a clear reference point.

**Step 3:** Demonstration

- Demonstrate how to use a practice fire extinguisher safely, explaining each part and its function (handle, nozzle, etc.).

**Step 4:** Practice

- Allow students to practice using the fire extinguisher (on a designated practice target if available or through a simulated activity) while being supervised.

- Encourage teamwork and communication.

**Conclusion (5 minutes):**

- Summarize Key Points:

- Reinforce the key steps discussed about using a fire extinguisher.

- Interactive Activity:

- Conduct a quick quiz or game where students recall the steps learned today.

- Prepare for Next Session:

- Preview the next topic on the different types of fire extinguishers and their specific uses.

**Extended Activities:**

- Research Project: Assign students to create a poster presentation on the different types of fire extinguishers, including which types are suitable for various fires and why.

- Role-Playing: Set up fire emergency scenarios in the classroom where students practice responding appropriately, emphasizing the importance of safety and communication.

- Fire Safety Plan Creation: Have students develop a fire safety plan for their home or school, detailing escape routes and where fire extinguishers are located.

**Teacher Self-Evaluation:**

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**WEEK 5: LESSON 5**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Practice fire control measures in the environment.

2.Learners should enjoy practicing the different fire control measures in the environment.

**Key Inquiry Question:**

- What are the dangers of fire in the environment?

**Learning Resources:**

- Environment

- Digital devices

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Begin by briefly reviewing the previous lesson on elements and compounds, specifically focusing on their properties.

2. Introduce the topic of fire and its classifications, relating it to the importance of understanding materials in our environment.

3. Ask students to brainstorm some hazards of fire they may have encountered or learned about.

**Lesson Development (30 minutes):**

**Step 1:** Understanding Fire Classes

- Guide students in defining different classes of fire (A, B, C, D, K).

- Use digital resources to present videos or interactive lessons on each fire class and the materials they involve.

- Discuss the characteristics of each class and corresponding fire control measures.

**Step 2:** Group Formation

- Divide the class into small groups of 4-5 learners.

- Assign each group a specific fire class to research further using digital devices (for instance, materials that cause Class B fires, such as flammable liquids).

- Instruct groups to prepare a brief presentation on their assigned fire class.

**Step 3:** Collaborative Fire Control Practice

- Have each group present their research findings, focusing on fire control measures for their assigned class.

- After presentations, engage students in a collaborative role-play where they simulate controlling fires based on their assigned classes. Utilize scenarios (real or hypothetical) that require applying learned fire control measures.

**Step 4:** Safety Protocols

- Conclude the group activity by guiding students to list safety protocols they should follow in case of fire emergencies.

- Discuss the importance of these measures in the environment and how they can contribute to fire safety in their own homes and communities.

- Summarize the key points about fire classes and the respective control measures practiced.

- Conduct an interactive quiz or brainstorming session to reinforce the main topics covered.

- Preview the upcoming lesson on how to create fire safety plans at home, encouraging students to think about personal responsibility in fire safety.

**Extended Activities:**

- Fire Safety Poster: Have students create a poster about fire safety measures specific to their homes or communities, including visuals and key points.

- Field Trip: Plan a visit to a local fire station to learn directly from professionals about fire safety and control measures.

- Research Project: Assign a research project where students explore the history and impact of fire in different environments (e.g., forests, urban areas) and report back to the class.

**Teacher Self-Evaluation:**

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**WEEK 6: LESSON 1**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. State the importance of access to information on flammable substances.

2. Explain why consumers should have access to this information.

3. Acknowledge the need for accessing information related to flammable substances.

**Key Inquiry Question:**

- Why is it necessary for consumers to have access to information on flammable substances?

**Learning Resources:**

- Active Integrated Science textbook

- Containers of flammable substances (real or mock)

- Digital devices (tablets or computers for research)

**Organisation of Learning:**

**Introduction (5 minutes):**

- Start the class by reviewing the previous lesson on mixtures and compounds.

- Prompt students to recall any examples of flammable substances they may have encountered.

- Guide learners to read a selected segment from their textbook that highlights the importance of safety information regarding flammable substances.

**Lesson Development (30 minutes):**

**Step 1:** Identify Flammable Substances

- Divide the class into small groups and provide each group with containers (or images) of different flammable substances (e.g., lighter fluid, gasoline, alcohol).

- Ask each group to examine the containers closely, noting any labels, warning signs, or safety instructions.

**Step 2:** Discuss the Information

- In their groups, have students discuss the symbols and information they found on the containers.

- Each group should list what types of information are typically found on these labels and what they mean (e.g., flammable symbols, hazard warnings).

**Step 3:** Importance of Access to Information

- Prompt a class discussion where groups share their findings.

- Ask guiding questions like: "Why is it important to know this information before using these substances?" and "What could happen if we didn’t have labels or warnings?"

**Step 4:** Practical Application

- Using digital devices, allow groups to research recent incidents where a lack of information led to accidents involving flammable substances.

- Ask each group to summarize their findings and share one key takeaway with the class.

**Conclusion (5 minutes):**

- Summarize the main points discussed during the lesson, focusing on the importance of access to information on flammable substances.

- Conduct a brief interactive quiz using a digital platform or paper-based questions to reinforce the main topics covered.

- Preview the next class topic related to chemical safety and the properties of other hazardous substances.

**Extended Activities:**

- Research Project: Have students select a common household flammable item and create an informative poster that includes its properties, safety precautions, and emergency procedures.

- Safety Campaign: Students can develop a campaign aimed at educating younger students about fire safety and the importance of recognizing flammable materials.

- Field Trip Idea: Plan a visit to a local fire station or safety center to learn about handling fire hazards and the materials fire fighter’s encounter.

**Teacher Self-Evaluation:**

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**WEEK 6: LESSON 2**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Identify the causes of fire in nature.

2. Explain the causes of fire in nature.

3. Prepare posters showing the classes of fire in nature.

4. Acknowledge the possible causes of fire in nature.

**Key Inquiry Question(s):**

- What are the possible causes of fire in nature?

**Learning Resources:**

- Active Integrated Science Lesson notes

- Resource books

- Digital devices (tablets/laptops)

- Internet access

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin with a quick review of the previous lesson to activate prior knowledge.

- Introduce today’s topic by discussing the importance of understanding fire in nature, including its causes and effects.

- Have students read and discuss relevant content from their learning resources to explain key concepts about fire.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming Causes of Fire

- Divide the class into small groups.

- Ask each group to brainstorm and list down possible natural causes of fire (e.g., lightning strikes, volcanic eruptions, spontaneous combustion).

- Have groups share their ideas with the class, writing them on the board or a digital platform.

**Step 2:** Research on Classes of Fires

- Guide students to use digital devices to search for clips or articles about different classes of fires (e.g., wildfires, structure fires, electrical fires).

- Encourage students to note down the key characteristics of each class of fire and its causes.

**Step 3:** Group Discussion

- In their groups, students discuss the information they found, focusing on how the causes of fire relate to the classes of fire.

- Facilitate a discussion encouraging students to connect their research to real-life examples.

**Step 4:** Poster Preparation

- Each group creates a poster that visually represents the classes of fire and their causes. They should include images, text, and any interesting facts.

- Remind them to prepare a clear, organized layout for their posters.

**Conclusion (5 minutes):**

- Summarize the key points covered in the lesson, emphasizing the different classes of fire and their natural causes.

- Conduct a brief interactive activity, such as a quiz or a reflection question, to reinforce understanding.

- Preview the next lesson's topics, such as the impact of fires on ecosystems or fire safety measures.

**Extended Activities:**

- Encourage students to research a recent natural fire incident and present their findings, focusing on the cause, impact, and safety measures taken.

- Suggest a field trip (virtual or physical) to a local fire station or forest service to learn about fire management.

- Have students create a digital presentation on how different natural elements can lead to fire outbreaks in nature.

**Teacher Self-Evaluation:**

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**WEEK 6: LESSON 3**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Classes of Fire

**Specific Learning Outcomes:**

**- By the end of the lesson, learners will be able to:**

1. State the dangers of fires in the environment.

2. Discuss the dangers of fire in the environment.

3. Prepare flashcards or posters showing the dangers of fire in the environment.

4. Acknowledge the dangers of fire in the environment.

**Key Inquiry Question(s):**

- What are the dangers of fires in the environment?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Posters with fire safety information

- Flashcards

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on mixtures and compounds and their importance.

- Guide learners to read and discuss relevant content from the learning resources, particularly focusing on the concept of fire and its dangers.

**Lesson Development (30 minutes):**

**Step 1:** Identify Dangers

- Group students into small teams and ask them to brainstorm the dangers of fires in both the school and local environment.

- Encourage them to consider various aspects, such as health risks, property damage, and environmental impact.

**Step 2:** Discussion

- Have each group share their findings, fostering a class discussion on the identified dangers.

- Guide students to connect fire dangers to the concepts of mixtures and chemical reactions, reinforcing how fire can be a chemical reaction involving various elements and compounds.

**Step 3:** Prepare Flashcards and Posters

- Each group creates flashcards or posters that highlight key dangers associated with fires.

- Include visual elements such as drawings or symbols. Encourage creativity and make sure they include information that addresses the main inquiry question.

**Step 4:** Display and Share

- Groups display their flashcards and posters in the classroom.

- Conduct a gallery walk where students can view each other’s work.

- Each group briefly presents their poster and shares one key point they discussed.

**Conclusion (5 minutes):**

- Summarize the key points covered in the lesson, emphasizing the importance of understanding fire dangers.

- Conduct a brief interactive activity, like a quick quiz or fire safety role-play, to reinforce the main topics.

- Prepare students for the next session by previewing upcoming topics, such as chemical reactions and how they relate to fire.

**Extended Activities:**

- Research Project: Students can choose a specific fire incident (e.g., a wildfire or a house fire) to research and present on its causes and consequences.

- Fire Safety Campaign: Organize a campaign in school where students design flyers or digital content to raise awareness about fire safety measures within their communities.

- Field Trip: Arrange a visit to a local fire station to understand how firefighters respond to such dangers and learn about fire safety equipment.

**Teacher Self-Evaluation:**

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**WEEK 6: LESSON 4 - 5**

**Strand:** Mixtures, Elements, and Compounds

**Sub Strand:** Classes of Fire Project

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. Prepare posters on classes of fires and their control measures.

2. Value each other's efforts in preparing the posters.

**Key Inquiry Question(s):**

- What materials will you use in preparing the posters on classes of fires and their control measures?

**Learning Resources:**

- Cartons

- Manillas

- Marker pens

- Metre rules

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson focusing on elements, compounds, and mixtures.

- Guide students to read and discuss fire safety related to chemistry, emphasizing the key concepts of fire classes and their control measures.

**Lesson Development (30 minutes):**

**Step 1:** Group Formation

- Divide students into small groups of 4-5.

- Assign each group a specific class of fire: A (ordinary combustibles), B (flammable liquids), C (gaseous fuels), and D (metals).

**Step 2:** Material Preparation

- Provide each group with the necessary materials (cartons, manillas, marker pens, and metre rules).

- Instruct groups to brainstorm and note key facts about their assigned fire class and its control measures.

**Step 3:** Poster Creation

- Guide groups in designing their posters, ensuring they include visuals, definitions, and control measures for their fire class.

- Emphasize collaboration and creativity while encouraging the use of clear, legible writing.

**Step 4:** Display and Share

- groups will hang their posters in designated school areas.

- Each group presents their poster briefly to the class, encouraging questions and constructive feedback from peers.

**Conclusion (5 minutes):**

- Summarize the key points learned during the lesson, notably the different classes of fire and their control measures.

- Conduct an interactive game, like "fire safety trivia," to reinforce the main concepts.

- Prepare learners for the next session by previewing the topic of chemical reactions, asking them to think of examples of reactions that might involve fire.

**Extended Activities:**

- Fire Safety Campaign: Have students create digital presentations or videos about fire safety tips to share with younger students or the wider community.

- Research Assignment: Ask students to investigate a recent fire incident and analyze the classes of fire involved, suggesting what could have been done to prevent it.

- Fire Drill Simulation: Organize a role-play where students simulate responding to a fire scenario based on the knowledge they've gained about fire classes.

**Teacher Self-Evaluation:**

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**WEEK 7: LESSON 1**

**Strand:** Mixtures, Elements and Compounds

**Sub Strand:** Classes of Fire Assessment

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Attempt assessment questions on the sub-strand.

**Key Inquiry Question(s):**

- How can we identify different classes of fire and their properties using written questions?

- What types of assessment questions can enhance our understanding of fire classes?

**Learning Resources:**

- Written questions related to classes of fire (worksheets)

- Assessment rubrics for grading

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin with a quick review of the previous lesson on elements and compounds, focusing on how they relate to fire.

- Engage the students in a discussion, prompting them to share what they remember about fire classifications and safety.

- Guide learners to read and discuss relevant content from the written questions, emphasizing understanding of fire classes.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Classes of Fire

- Present different classes of fire: A (ordinary combustibles), B (flammable liquids), C (electrical), D (metals), and K (kitchen).

- Use visuals or diagrams to illustrate each type, highlighting key examples and safety methods related to each class.

**Step 2:** Understanding Fire Extinguishers

- Discuss the different types of fire extinguishers and which class of fire they are used for.

- Demonstrate with a chart or video showing the effective use of each extinguisher.

- Engage students by asking them to identify which extinguisher to use for hypothetical fire scenarios.

**Step 3:** Written Assessment Questions

- Distribute written assessment questions based on the classes of fire discussed.

- Allow students time to think and answer the questions individually, promoting critical thinking.

**Step 4:** Peer Review and Discussion

- Organize students into pairs to review each other's answers.

- Facilitate a class discussion where groups can share their thoughts on the questions and clarify any misunderstandings.

**Conclusion (5 minutes):**

- Summarize key points covered regarding the classifications of fire and their management.

- Conduct a brief interactive activity: For instance, a quiz game where students can answer true or false questions about the fire classes to reinforce learning.

- Prepare learners for the next session by giving them a preview of upcoming topics on fire prevention strategies.

**Extended Activities:**

- Research Project: Students can choose one class of fire to research further. They can create a poster that outlines its characteristics, dangers, and prevention methods.

- Fire Drill Simulation: Organize a fire drill to demonstrate and apply understanding of safety procedures related to different classes of fire in a practical context.

**Teacher Self-Evaluation:**

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**WEEK 7: LESSON 2**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Define the term "cell."

2.Discuss the procedure of using light microscopes in the laboratory.

3. Prepare flashcards showing how to care for a light microscope in the laboratory.

4.Show care when using the light microscope in the laboratory.

**Key Inquiry Questions:**

- What is a cell?

- What are the steps of using a light microscope?

**Learning Resources:**

- Active Integrated Science.

- Lesson notes.

- Digital devices.

- Light microscope.

- Laboratory.

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on the characteristics of living things.

- Guide learners to read and discuss relevant content from the learning resources about cells and microscopes. Emphasize the importance of understanding cells and tools scientists use to study them.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming the Definition of a Cell

- In pairs, learners will brainstorm what they think a cell is and share their ideas with the class.

- Write down key responses on the board.

**Step 2:** Identifying Parts of a Light Microscope

- Introduce the light microscope and its importance in studying cells.

- Present parts of a light microscope (e.g., eyepiece, objective lens, stage).

- Use a digital device to display labeled diagrams of the microscope.

**Step 3:** Discussing the Use and Handling of a Light Microscope

- In small groups, learners will discuss and list the steps for using a light microscope, including adjustments and focus techniques.

- Each group will present their findings and discuss proper handling and etiquette in the lab (e.g., carrying the microscope with two hands, using lens paper).

**Step 4:** Creating Flashcards and Practicing Care

- Learners will create flashcards that outline the care procedure for a light microscope, including cleaning and storage.

- Allow some time for practice using the microscopes with guidance, reinforcing the importance of careful usage.

**Conclusion (5 minutes):**

- Summarize key points regarding the definition of a cell and the steps for using a light microscope.

- Conduct a brief interactive quiz or discussion to reinforce the main topics (e.g., "What would you do if you noticed a dirty lens?").

- Prepare learners for the next session by previewing future topics such as the different types of cells (prokaryotic vs eukaryotic) or introducing the concept of cell function.

**Extended Activities:**

- Microscope Scavenger Hunt: Learners can create a list of items or structures to find using the microscope (e.g., plant cells, animal cells).

- Cell Art Project: Create an artistic representation of a cell, labeling its parts and functions, to enhance understanding visually.

- Research Assignment: Investigate a specific type of cell (e.g., nerve cells, muscle cells) and present findings to the class.

**Teacher Self-Evaluation:**

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**WEEK 7: LESSON 3**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell - 2

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. Outline the procedure of preparing, mounting, and observing cells on a light microscope.

2. Discuss the process of preparing temporary slides of cells under a light microscope.

3.Use digital devices to search for clips on preparation and mounting of cells under the light microscope.

4. Express a desire to prepare temporary slides of plant cells and observe them under a light microscope.

**Key Inquiry Question(s):**

- What is mounting?

- Why is staining important in the preparation of slides?

**Learning Resources:**

- Active Integrated Science textbook

- Digital devices (tablets/laptops)

- Video clips on microscope slide preparation

- Lesson notes

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin by reviewing the previous lesson on cells and their functions.

- Ask students to share what they remember about cell structures and their importance in living things.

- Introduce key concepts related to slide preparation and the use of light microscopes.

**Lesson Development (30 minutes):**

**Step 1:** Research the Procedure

- In groups, students will search the internet or use printed resources to find information on how to prepare temporary slides of plant cells.

- Encourage them to focus on essential steps like gathering materials, preparing samples, and using the microscope.

**Step 2:** Group Discussion

- Have each group discuss their findings and outline the steps they found most important for preparing and mounting cell slides.

- Facilitate a whole-class discussion where groups can present key points from their discussions.

**Step 3:** Watch Video Clips

- Instruct students to use digital devices to watch brief video clips demonstrating the procedures of preparing and observing slides of plant cells under a light microscope.

- Ask them to take notes on observations made during the videos, particularly focusing on mounting and staining.

**Step 4:** Reflective Sharing

- Have a class discussion where students can share insights gained from the videos and clarify any questions they may have about the process.

- Pose the inquiry questions for students to answer based on their research and video watching.

**Conclusion (5 minutes):**

- Summarize the key points discussed in the lesson, such as the importance of mounting and staining in slide preparation.

- Conduct an interactive quiz or group activity where students can answer questions related to preparing microscope slides and cell observation techniques.

- Prepare students for the next session by providing a preview of what will be covered in upcoming lessons, such as cell types and their functions.

**Extended Activities:**

- Practical Session: Organize a lab session where students can prepare their own temporary slides of a plant cell, such as onion skin or leaf tissue, and observe their findings using a light microscope.

- Research Project: Have students create a presentation on the importance of staining in microscopy. They could explore different staining techniques and their uses in biological research.

- Microscopy Journal: Encourage students to maintain a journal documenting their observations and experiences with microscopes, including sketches of what they see under the microscope.

**Teacher Self-Evaluation:**

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**WEEK 7: LESSON 4**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Outline the procedure for preparing a temporary slide of a plant cell.

2. Carry out an experiment on preparing, mounting, and observing a plant cell under a light microscope.

3. Draw the plant cell as seen under the light microscope.

4. Enjoy carrying out the experiment.

**Key Inquiry Question(s):**

- How do you prepare a temporary slide of a plant cell?

**Learning Resources:**

- Light Microscope

- Lesson notes

- Onion cells (or other plant material)

- Slides and cover slips

- Laboratory tools and materials

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Review the Previous Lesson: Start with a brief recap of what was covered in the last class about cells. Ask a few questions to engage the learners and assess their understanding.

2. Guided Reading/Discussion: Provide learners with relevant sections from the lesson notes. Encourage them to read aloud and discuss important concepts related to plant cells, focusing on structure and functions.

**Lesson Development (30 minutes):**

**Step 1:** Gathering Materials

- In groups, learners will gather the necessary materials: microscope, onion cells, slides, cover slips, and a dropper.

**Step 2:** Preparing the Slide

- Instructions: Demonstrate how to prepare a slide. Explain the process of placing a thin slice of onion on the slide and adding a drop of water.

- Activities: Learners will follow the steps, ensuring they handle the materials carefully and place the cover slip gently over the cell.

**Step 3:** Observing Under the Microscope

- Instructions: Explain how to adjust the light microscope and focus on the slide with the plant cells.

- Activities: Learners will observe their prepared slides, taking notes on what they see and discussing in their groups.

**Step 4:** Drawing the Observations

- Instructions: Show examples of how to draw what is seen under the microscope, highlighting different parts of the cell.

- Activities: Learners will draw their own observations, labeling key parts such as the cell wall, cytoplasm, and nucleus.

**Conclusion (5 minutes):**

- Summary: Recap the key points discussed during the lesson, reinforcing procedures and observations.

- Interactive Activity: Conduct a short quiz or game where learners can ask questions about what they learned and share what they found most interesting.

- Preview: Inform learners of the topics to be covered in the next session, such as different cell types and their functions.

**Extended Activities:**

- Plant Cell Model: Have learners create a 3D model of a plant cell using craft materials.

- Cell Research Project: Ask learners to research and present on various types of plant cells found in nature, such as guard cells or root cells.

**Teacher Self-Evaluation:**

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**WEEK 7: LESSON 5**

**Strand:** Living Things and Their Environment

**Sub-Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. Identify the organelles present in plant cells.

2. Describe the structure of plant cells as observed under a light microscope.

3. Acknowledge the function of each cell organelle present in plant cells.

**Key Inquiry Question(s):**

- What are the cell organelles found in plant cells as seen under a light microscope?

**Learning Resources:**

- Active Integrated Science textbook

- Pictures and diagrams of plant cells

- Lesson notes

- Digital devices (tablets or computers)

- Drawings of plant cells as seen under light microscope

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on cells, highlighting key concepts discussed.

- Guide students to read and discuss relevant content from lesson notes and visual resources, focusing on understanding plant cell structures and their functions.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Cell Organelles

- Briefly introduce the main organelles found in plant cells such as the cell wall, chloroplasts, vacuoles, nucleus, and cytoplasm.

- Show images of each organelle, discussing their functions briefly as a class.

**Step 2:** Investigation and Research

- Students will be divided into small groups and tasked with using digital devices or print resources to locate information on specific organelles present in plant cells.

- Each group will prepare a list of the organelles they researched along with one key function for each.

**Step 3:** Drawing and Labeling

- Students will use blank worksheets to draw a plant cell and label the organelles they identified in Step 2. They should ensure their drawings are accurate and illustrative.

**Step 4:** Group Discussion

- Each group will present their drawing to the class, explaining the structure and function of the organelles they researched. Facilitate a discussion around any similarities or differences observed in their findings.

**Conclusion (5 minutes):**

- Summarize the key points learned about plant cell organelles and their structures.

- Conduct a brief quiz or interactive activity to reinforce learning, such as flashcard matching activity featuring different organelles and their functions.

- Preview upcoming topics related to cell functions and types, encouraging students to think about how cells interact in larger systems.

**Extended Activities:**

- Assignment: Research a specific type of plant cell (e.g., leaf cells, root cells) and prepare a presentation highlighting their unique structures and functions.

- Activity: Create a 3D model of a plant cell using craft supplies, ensuring all organelles are represented and labeled.

- Experiment: Observe real plant cells under a light microscope and record observations of differences between various plant parts (like leaves versus roots).

**Teacher Self-Evaluation:**

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**WEEK 9: LESSON 1**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1. Outline the procedure for preparing permanent slides of animal cells.

2. Observe a permanent slide of an animal under the light microscope.

3. Draw the animal cell as seen under the light microscope.

4. Enjoy the experience of observing permanent slides of animal cells under the light microscope.

**Key Inquiry Question:**

- What is the difference between permanent and temporary slides?

**Learning Resources:**

- Active Integrated Science textbook

- Light microscope

- Permanent slides of animal cells

- Lesson notes

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin by reviewing the previous lesson on cells and their functions.

- Ask students to discuss in pairs what they remember about different types of slides. Guide discussion with these prompts:

- What types of slides have we worked with before?

- Can someone explain what a permanent slide is?

**Lesson Development (30 minutes):**

**Step 1:** Outline the Procedure

- In small groups, guide the students to outline the steps needed to prepare permanent slides of animal cells. Provide them with a template or write key points on the board to prompt their discussions.

- Discuss the importance of each step in preserving the cell structure.

**Step 2:** Observe the Slides

- Provide each group with a light microscope and prepared permanent slides of animal cells.

- Instruct students on how to properly use the microscope to observe the slide. Encourage them to take notes on what they can see, focusing on key cell structures like the nucleus, cell membrane, and cytoplasm.

**Step 3:** Draw Observations

- Each student should draw the animal cell as they see it under the microscope, labeling important parts they have observed.

- Encourage creativity in their drawings while ensuring they maintain scientific accuracy based on their observations.

**Step 4:** Group Sharing

- Have each group share their drawings and observations with the class. Promote discussion by asking guiding questions, such as:

- What structures are common in different drawings?

- Did anyone notice something unique about their slide?

**Conclusion (5 minutes):**

- Summarize the key points covered during the lesson, including the procedures for preparing slides, observation techniques, and drawing practices.

- Conduct a quick interactive quiz or a Q&A session to reinforce learning.

- Briefly introduce the next lesson's topic, encouraging students to think about how the structure of cells relates to their functions.

**Extended Activities:**

- Group Research Project: Assign groups to research different types of animal cells (e.g., muscle cells, nerve cells) and present their findings on what makes each type unique.

- Cell Model Creation: Have students create 3D models of animal cells using household materials, emphasizing the structure and function of each part.

- Inquiry Journal: Encourage students to keep a science journal where they can reflect on experiments, observations, and what they learned about cells throughout the unit.

**Teacher Self-Evaluation:**

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**WEEK 9: LESSON 2**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. Identify the cell organelles present in animal cells as observed under a light microscope.

2. Describe the structure of the animal cell as seen under the light microscope.

3. Acknowledge the functions of the cells present in animal cells.

**Key Inquiry Question:**

What are the parts of an animal cell as observed under the light microscope?

**Learning Resources:**

- Active Integrated Science text

- Lesson notes

- Pictures of animal cells under a light microscope

- Digital devices (tablets/laptops for research)

- Drawings of animal cells for comparison

**Organization of Learning:**

**Introduction (5 minutes):**

- Welcome students and take attendance.

- Review the previous lesson, briefly discussing cell types and their importance in living organisms.

- Guide students to read and discuss the relevant content from the learning resources, emphasizing key concepts related to animal cells.

**Lesson Development (30 minutes):**

**Step 1:** Exploring Animal Cells

- In groups, provide students with access to digital devices. They will search for images of animal cells observed under a light microscope.

- Encourage students to observe different images and note the various features they see.

**Step 2:** Drawing Comparison

- After collecting images, students will refer to their drawings of animal cells and compare them with the pictures they found.

- Lead a discussion about any similarities and discrepancies between their drawings and the actual images.

**Step 3:** Identify Cell Parts

- Each group will create a list of the organelles identified in the images, such as the nucleus, mitochondria, endoplasmic reticulum, and others.

- They should also assign a simple description of each organelle's function based on what they’ve learned.

**Step 4:** Group Sharing

- Groups will share their findings with the class. Each group will take turns presenting one organelle, its structure, and its function.

- Facilitate a Q&A after each presentation to encourage deeper understanding.

**Conclusion (5 minutes):**

- Summarize key points discussed during the lesson, including the organelles’ names, functions, and structure.

- Conduct a quick interactive quiz to reinforce the main topics (e.g., "Can anyone name the part of the cell that controls what enters and exits?").

- Provide a preview of the next session focusing on plant cells, encouraging students to consider how plant cells differ from animal cells.

**Extended Activities:**

- Assign students to create a detailed poster of an animal cell, including drawings of each organelle labeled with names and functions.

- Encourage students to research a specific organelle and create a short presentation or a digital infographic about its importance to overall cell function.

- Suggest that students explore the differences between animal cells and plant cells through a hands-on experiment, such as examining onion cells under a microscope.

**Teacher Self-Evaluation:**

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**WEEK 9: LESSON 3**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1.State the functions of the components of cells as seen under the light microscope.

2.Describe the functions of components of the cells as seen under the light microscope.

3.Search the internet for information on the functions of the components of the cells.

4.Appreciate the functions of the different components of the cells.

**Key Inquiry Question:**

- What are the functions of the different components of the cell as observed under a light microscope?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Digital devices (computers/tablets)

- Charts

- Marker pens

**Organization of Learning:**

**Introduction (5 minutes):**

1. Begin by reviewing the previous lesson on cell structure.

2. Pose the key inquiry question to the students and guide them in reading relevant content from the learning resources.

**Lesson Development (30 minutes):**

**Step 1:** Group Research

- Divide the class into small groups and assign each group a component of the cell (e.g., nucleus, mitochondria, cell membrane).

- Instruct students to use digital devices or textbooks to conduct research on their assigned component's function as observed under a light microscope.

**Step 2:** Group Discussion

- Ask each group to discuss their findings among themselves.

- Encourage them to consider questions like: What is the role of this component in the cell? How does it contribute to the cell's overall function?

**Step 3:** Prepare Charts

- Have each group create a chart summarizing the functions of their assigned component.

- Students can use markers to make their charts visually appealing and informative.

**Step 4:** Presentations

- Invite each group to present their findings to the class.

- Encourage the audience to ask questions and engage in a brief discussion after each presentation.

**Conclusion (5 minutes):**

- Summarize the key points discussed during the lesson, highlighting the functions of various cell components.

- Conduct a quick interactive activity, such as a quiz or a think-pair-share, to reinforce the main topics.

- Prepare learners for the next session by giving them a preview of what they will learn next (e.g., cellular processes or different types of cells).

**Extended Activities:**

- Cell Model Project: Students can create a 3D model of a cell using materials at home and label the components with their functions.

- Research Assignment: Have students choose a specific type of cell (e.g., plant cell, animal cell, bacterial cell) and prepare a short report on its functions and differences compared to other cell types.

- Field Study: Organize a visit to a local science lab where students can observe cells under a light microscope and see the components discussed in class.

**Teacher Self-Evaluation:**

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**WEEK 9: LESSON 4**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1. Identify the similarities between the plant and animal cells as seen under the light microscope.

2.Discuss the similarities between plant and animal cells.

3. Prepare a PowerPoint presentation on the similarities between animal and plant cells.

4.Acknowledge the similarities between the animal and plant cells.

**Key Inquiry Question(s):**

- What are the similarities between animal and plant cells as seen under the light microscope?

**Learning Resources:**

- Active Integrated Science textbook

- Drawings of animal and plant cells

- Lesson notes

- Digital devices (computers/tablets for PowerPoint)

**Organisation of Learning:**

**Introduction (5 minutes):**

- Start with a quick review of the previous lesson on cell structures.

- Ask guiding questions to connect students’ prior knowledge to today’s topic.

- Have learners read a relevant section from their notes about plant and animal cells, focusing on similarities.

**Lesson Development (30 minutes):**

**Step 1:** Observation

- In pairs, provide students with drawings of plant and animal cells.

- Have them observe the drawings closely and identify visible structures.

**Step 2:** Identification

- Have students create a Venn diagram in their notebooks to list the similarities and differences they observe between the two cell types.

- Encourage them to share their findings with their partners.

**Step 3:** Discussion

- Facilitate a class discussion where pairs share their identified similarities.

- Write key points on the board, highlighting the major similarities such as cell membrane, nucleus, and cytoplasm.

**Step 4:** Presentation Preparation

- Guide students in using digital devices to create a PowerPoint presentation that summarizes their findings on the similarities of plant and animal cells.

- Encourage creativity in their presentations, such as including images and bullet points.

**Conclusion (5 minutes):**

- Summarize the key similarities discussed during the lesson.

- Conduct a quick interactive quiz where students can raise their hands to answer questions based on the day’s content.

- Preview the next session on cell functions or organelles to maintain student engagement.

**Extended Activities:**

- Have students research a specific type of plant or animal cell and create a fact sheet comparing its structure to another type they studied.

- Encourage students to create a short video presentation on their findings using emails or another suitable platform.

- Organize a "Cell Analogy" project where students can present how cells are like a certain system (e.g., city, factory) and relate the functions of cell parts.

**Teacher Self-Evaluation:**

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**WEEK 9: LESSON 5**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Identify the differences between plant and animal cells as seen under the light microscope.

2.Discuss the differences between animal and plant cells.

3. Prepare a PowerPoint presentation showing the differences between plant and animal cells.

4.Acknowledge the differences between animal and plant cells.

**Key Inquiry Question:**

- What are the differences between plant and animal cells as seen under the light microscope?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Digital devices (computers/tablets)

- Drawings of animal and plant cells as seen under a light microscope

**Organisation of Learning:**

**Introduction (5 minutes):**

- Quickly review the previous lesson on cell structures.

- Encourage learners to share any prior knowledge they have regarding plant and animal cells.

- Introduce the key inquiry question to focus the lesson: "What are the differences between plant and animal cells?"

**Lesson Development (30 minutes):**

**Step 1:** Observation

- In pairs, students will observe their drawings of plant and animal cells. They'll identify features such as cell wall, chloroplasts, and shapes.

- Provide guidance and prompts to help students focus their observations on what they see.

**Step 2:** Group Discussion

- Each pair will join another pair to form small groups.

- Groups will discuss the differences they noted in their drawings. Encourage them to record these differences for their presentations.

**Step 3:** Research and Presentation Preparation

- Using digital devices, groups will create a PowerPoint presentation highlighting at least five differences between plant and animal cells.

- Emphasize the use of clear images and bullet points for each difference.

**Step 4:** Presentations

- Each group will present their PowerPoint to the class, summarizing their findings.

- Allow time for questions and feedback from peers after each presentation.

**Conclusion (5 minutes):**

- Summarize the key points discussed during the lesson, including the main differences between plant and animal cells.

- Conduct an interactive quiz where students can buzz in to answer questions about the differences discussed.

- Preview the next lesson, which may delve into cell functions or cellular processes.

**Extended Activities:**

- Cell Model Creation: Students can create a 3D model of plant or animal cells using household materials to reinforce their understanding of cell organelles.

- Cell Comparison Chart: Learners can create a chart for home use, highlighting differences in various cell types (e.g., bacteria, fungi, etc.) to expand their knowledge beyond just plant and animal cells.

- Virtual Microscope Lab: Use online resources or apps that simulate viewing cells under a microscope for those who may want to explore more on their own.

**Teacher Self-Evaluation:**

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**WEEK 10: LESSON 1**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, the learner should be able to:**

1. Define the term magnification.

2.Identify the formula for calculating magnification of specimens at various objective lenses of a light microscope.

3.Calculate magnification of specimens using the light microscope.

4.Enjoy calculating the magnification of specimens by applying the formula.

**Key Inquiry Question(s):**

- What is magnification?

- How do you calculate the magnification of specimens at various objective lenses of a light microscope?

**Learning Resources:**

- Active Integrated Science

- Calculators

- Light microscope

- Lesson notes

**Organisation of Learning:**

**Introduction (5 minutes):**

- Start with a quick review of the previous lesson about cells and their components.

- Engage learners in reading a short passage from the learning resources about magnification. Ask them to underline key terms they think might relate to magnification.

**Lesson Development (30 minutes):**

**Step 1:** Define Magnification

- In pairs, have students brainstorm what they think the term "magnification" means.

- After a few minutes, ask each pair to share their definitions.

- Summarize and provide a clear definition of magnification: "Magnification is the process of increasing the apparent size of an object."

**Step 2:** Introduce the Formula for Magnification

- Present the formula for calculating magnification (Magnification = Image Size / Actual Size).

- Explain each component of the formula with an example.

- Allow students to practice writing the formula in their notebooks.

**Step 3:** Calculate Magnification

- Using the light microscope, demonstrate how to find the actual size of a specimen (e.g., a hair or a leaf) and measure the image size using an ocular micrometer if available.

- Break students into small groups, each using the microscope to obtain image and actual size of their chosen specimen and then calculate the magnification using the formula.

**Step 4:** Share Findings

- Each group presents their calculated magnifications to the class.

- Encourage them to discuss any challenges they faced and how they overcame them.

**Conclusion (5 minutes):**

- Summarize the key points discussed during the lesson regarding magnification and the formula.

- Conduct a quick interactive quiz (could be a thumbs up/thumbs down) on their understanding of the concepts discussed.

- Give students a brief preview of the next lesson about cell structures and their functions, encouraging them to think about how magnification might play a role in understanding cells better.

**Extended Activities:**

- Create a "magnification poster" project: Students can select a specimen they observe (e.g., leaves, insects) and create a poster that includes images of the specimen at different magnifications, along with a description of how they calculated the magnification.

- Organize a micro-exploration day: Challenge students to collect various materials from nature (like tiny flowers, leaves, etc.) to observe under the microscope and then write a short report on their findings along with calculations of magnification.

**Teacher Self-Evaluation:**

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**WEEK 10: LESSON 2**

**Strand:** Living Things and Their Environment

**Sub Strand:** The Cell. Assessment

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1.Attempt assessment questions on the sub-strand: The Cell.

**Key Inquiry Question(s):**

- What are the key components and functions of cells?

- How do cells contribute to the larger system of living organisms?

**Learning Resources:**

- Assessment books

- Teacher's Assessment Questions

- Active Integrated Science textbook

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Quickly review the previous lesson about the characteristics of living organisms and the importance of cells.

2. Guide learners to read key sections about cells from the Active Integrated Science textbook, encouraging a brief discussion to ensure understanding of key concepts such as cell structure and functions (e.g., cell membrane, nucleus, organelles).

**Lesson Development (30 minutes):**

**Step 1:** Read and Understand

- Each student or pair will read a section on cell types (plant vs. animal cells) and identify the main differences.

- Encourage highlighting or taking notes on important characteristics and functions of the organelles.

**Step 2:** Discussion and Concept Clarification

- After reading, pairs will discuss their findings and clarify any misunderstandings.

- Teacher circulates to provide support and address any questions.

**Step 3:** Assessment Question Attempt

- Distribute assessment questions focused on the components and functions of cells.

- Allow students 15 minutes to answer the questions individually or collaboratively.

**Step 4:** Review and Reflection

- Reconvene as a class and go over the answers to the assessment questions.

- Discuss reasons for correct answers and common misconceptions.

**Conclusion (5 minutes):**

- Summarize key points covered during the lesson, including the structure and function of cells.

- Conduct a brief interactive activity, such as a "Cell Match" where students match organelles with their functions using flashcards.

- Prepare learners for the next session by previewing the topic of cellular processes, such as photosynthesis and respiration, and encouraging curiosity with questions to ponder.

**Extended Activities:**

- Cell Model Project: Ask learners to create a 3D model of a plant or animal cell using materials at home (e.g., clay, cardboard). This will deepen their understanding of cell organelles.

- Cell Journal: Have students keep a journal where they can summarize what they learn about cells each week, including drawings and explanations of different cell types.

**Teacher Self-Evaluation:**

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**WEEK 10: LESSON 3**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of the Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1.Define the term \*diffusion\* as a process involved in the movement of materials in and out of cells.

2. Explain the factors that affect the rate of diffusion in particles.

3.Search the internet for information on factors that affect the rate of diffusion.

4.Acknowledge the factors that affect the rate of diffusion.

**Key Inquiry Question(s):**

- How do materials move in and out of the cell?

**Learning Resources:**

- Lesson notes

- Digital devices

- Active Integrated Science textbook

**Organization of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson briefly, revisiting key concepts related to cells and their functions.

- Ask students to share their initial thoughts about how substances might move into or out of a cell.

**Lesson Development (30 minutes):**

**Step 1:** Understanding Diffusion

- In pairs, students brainstorm and write a simple definition of \*diffusion\*.

- Discuss common real-life examples of diffusion (e.g., perfume scent spreading in a room, food coloring in water).

**Step 2:** Exploring Factors Affecting Diffusion

- Introduce and explain key factors that affect diffusion, such as temperature, concentration gradient, and particle size.

- In groups, students will use digital devices to search for and gather information on these factors and how they influence diffusion in different substances.

**Step 3:** Group Discussion

- Bring the class back together to share findings from their searches. Formation of a T-chart or concept map on the board to visualize the factors affecting diffusion.

**Step 4:** Real-Life Application

- Engage students in discussing how understanding diffusion is applicable to real-life situations, such as in biology (e.g., how oxygen enters cells), and how it relates to health and medicine (e.g., drug delivery in the body).

**Conclusion (5 minutes):**

- Summarize the key points covered in the lesson, reiterating the definition of diffusion and its affecting factors.

- Conduct a quick interactive quiz using a digital tool (e.g., Kahoot or Quizizz) to reinforce the main concepts covered.

- Provide a preview of the next lesson, which will delve deeper into osmosis and how it relates to diffusion.

**Extended Activities:**

- Project: Students can create a visual presentation or a poster showing examples of diffusion in different contexts (biological, chemical, environmental).

- Experiment: Conduct a simple diffusion experiment using food coloring in water to visually demonstrate how diffusion occurs over time.

- Research Assignment: Assign students to research how diffusion plays a role in human health, such as the diffusion of nutrients in the bloodstream.

**Teacher Self-Evaluation:**

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**WEEK 10: LESSON 4**

**Strand:** Living Things and Their Environment

**Sub-Strand:** Movement of Materials In and Out of Cells

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. Outline steps to demonstrate diffusion in liquids and gases.

2. Carry out simple experiments to demonstrate diffusion in liquids and gases.

3. Enjoy carrying out the experiment on diffusion.

**Key Inquiry Question:**

- How can we demonstrate diffusion in liquids and gases?

**Learning Resources:**

- Lesson notes

- Active Integrated Science textbook

- Ammonia solution

- Water

- Beakers

- Ink

- Potassium permanganate

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin with a brief review of the previous lesson on cells and their importance in living organisms.

- Introduce diffusion as a process that allows materials to move in and out of cells.

- Refer to the learning resources, guiding learners to read a relevant section to discuss key concepts of diffusion.

**Lesson Development (30 minutes):**

**Step 1:** Identify Requirements

- In groups of 4-5, students will brainstorm and list the materials needed to demonstrate diffusion in liquids and gases.

- Each group shares their list with the class, and the teacher will compile these materials on the board.

**Step 2:** Outline the Steps

- Groups will discuss and outline the steps to demonstrate diffusion.

- Each group creates a simple procedure for one experiment (e.g., diffusion of ink in water or ammonia in air) and writes it on a poster.

- Groups will present their procedures to the class, allowing for questions and clarifications.

**Step 3:** Conduct Experiments

- Students will conduct their chosen experiments using the provided materials.

- Demonstrate the diffusion of ink in water or potassium permanganate in water as the teacher leads a guided demonstration.

- Monitor groups as they conduct their experiments, providing support as needed.

**Step 4:** Observe and Discuss

- After performing the experiments, students will observe the results.

- Each group discusses and documents their observations about how diffusion occurred in their experiments.

- Groups present their findings to the class, focusing on the differences observed in liquids versus gases.

**Conclusion (5 minutes):**

- Summarize the key points covered in the lesson, reiterating what diffusion is and its importance in biology.

- Conduct a quick interactive Q&A session to reinforce key concepts and address any questions.

- Preview the next session’s topics on osmosis and how it differs from diffusion.

**Extended Activities:**

- Creative Project: Have students create a poster or digital presentation that illustrates the process of diffusion in different scenarios (e.g., in the human body, in plants, or in the environment).

- Research Assignment: Students can research real-life applications of diffusion, such as its role in the respiratory system or in food preservation, and present their findings in the next class.

- Simulation Game: Introduce a simple diffusion simulation game that allows students to visualize the concept of diffusion through virtual learning tools.

**Teacher Self-Evaluation:**

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**WEEK 10: LESSON 5**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of the cell

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. State the roles of diffusion in living things.

2. Discuss the role of diffusion in living things.

3. Search the internet for information on the roles of diffusion in living things.

4. Appreciate the role of diffusion in living organisms.

**Key Inquiry Question:**

- What are the roles of diffusion in living organisms?

**Learning Resources:**

- Lesson notes

- Active Integrated Science textbook

- Digital devices (tablets/laptops)

- Posters

- Marker pens

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin by reviewing the previous lesson on cell structure and function.

- Guide learners to read and discuss relevant content from the lesson notes, focusing on the concept of diffusion. Use questions to facilitate discussion: "What do you remember about how cells interact with their environment?"

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Diffusion

- Provide a definition of diffusion: "Diffusion is the movement of particles from an area of high concentration to an area of low concentration."

- Discuss everyday examples of diffusion (e.g., the smell of baking cookies spreading through the house) to make the concept relatable.

**Step 2:** Group Research Activity

- Divide students into small groups and assign each group a specific topic related to diffusion (e.g., diffusion in plant cells, diffusion in animal cells, importance of diffusion in respiration).

- In their groups, students will use digital devices to search for information on their assigned topics. Encourage them to look for examples and illustrations.

**Step 3:** Group Discussion

- After the research phase, allow groups to share their findings with each other. Each group should summarize their information and discuss how diffusion affects the cells or organisms they researched.

- Encourage students to take notes on the points shared by other groups.

**Step 4:** Poster Creation

- Each group will create a poster that highlights the role of diffusion in living things, incorporating their research findings, diagrams, and relevant key points.

- Provide markers and materials for students to make their posters visually engaging.

**Conclusion (5 minutes):**

- Summarize the key points discussed, reinforcing the importance of diffusion in maintaining life processes within cells.

- Conduct a brief interactive activity (e.g., a quiz or a think-pair-share) to reinforce what they have learned about diffusion.

- Preview the next session by posing questions related to osmosis and how it differs from diffusion, encouraging students to think ahead.

**Extended Activities:**

- Assign students to conduct a simple home experiment to observe diffusion (e.g., placing food coloring in water and observing how it spreads over time).

- Encourage students to create a video presentation on diffusion, explaining the concept and its importance in living organisms, which can be shared with the class or posted online.

**Teacher Self-Evaluation:**

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**WEEK 11: LESSON 1**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Define osmosis as a process involved in the movement of materials in and out of cells.

2. Explain the meanings of hypertonic, hypotonic, and isotonic solutions.

3. Conduct an online search for information about hypertonic, hypotonic, and isotonic solutions in the context of osmosis.

4. Identify and acknowledge the differences between various osmotic solutions.

**Key Inquiry Question:**

- What is Osmosis?

**Learning Resources:**

- Active Integrated Science textbook

- Lesson notes

- Digital devices (tablets, computers)

- Video clips demonstrating osmosis and osmotic solutions

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on cell structure.

- Engage learners in a discussion about how substances move in and out of cells and why this is important for living things.

**Lesson Development (30 minutes):**

**Step 1:** Definition of Osmosis

- In groups, learners will use digital or print resources to search for the definition of osmosis.

- Each group will share their findings with the class.

- Identify osmosis as the movement of water across a semi-permeable membrane from an area of lower solute concentration to an area of higher solute concentration.

**Step 2:** Exploring Osmotic Solutions

- Learners will define hypertonic, hypotonic, and isotonic solutions.

- Each group will discuss and create a simple chart or diagram to illustrate these concepts.

- Encourage them to present their diagrams to the class for further clarification.

**Step 3:** Watching Video Clips

- Show video clips that illustrate how osmosis takes place in different types of solutions (hypertonic, hypotonic, isotonic).

- After viewing, hold a brief discussion to reinforce what they observed in the videos.

**Step 4:** Group Discussion and Acknowledgment

- Conduct a whole-class discussion summarizing the differences between the three types of solutions.

- Ask learners to cite real-life examples where these concepts can be observed (e.g., plants, medical applications).

**Conclusion (5 minutes):**

- Summarize key points about osmosis and the three types of solutions.

- Conduct a quick interactive quiz where learners recall definitions and examples of osmosis, hypertonic, hypotonic, and isotonic solutions.

- Prepare learners for the next session by introducing the concept of active transport, which will build on their understanding of osmosis.

**Extended Activities:**

- Osmosis in Action: Have students design an experiment using potatoes and saltwater to observe osmosis firsthand. Encourage them to record their findings and present them in the next class.

- Research Project: Assign a project where students research how osmosis is vital in real life (e.g., its role in plant watering, human health, etc.) and present their findings to the class.

**Teacher Self-Evaluation:**

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**WEEK 11: LESSON 2**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of Cells

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Identify the factors that affect the rate of osmosis in living things.

2. Discuss the factors that affect the rate of osmosis in living things.

3. Search the internet for information on the factors that affect the rate of osmosis.

4.Acknowledge the factors that affect the rate of osmosis.

**Key Inquiry Question(s):**

- What factors affect the rate of osmosis in living things?

**Learning Resources:**

- Lesson notes.

- Active Integrated Science textbook.

- Digital devices (tablets/laptops).

- Flashcards.

**Organisation of Learning:**

**Introduction (5 minutes):**

- Begin the lesson by briefly reviewing the previous topic covered.

- Engage students by asking them to share one thing they remember about osmosis.

- Introduce the day's learning goals, focusing on understanding factors affecting osmosis.

**Lesson Development (30 minutes):**

**Step 1:** Brainstorming

- Divide learners into small groups.

- In their groups, ask students to brainstorm and list potential factors that could influence the rate of osmosis in living things.

- Encourage them to think of both biological and environmental factors.

**Step 2:** Research

- Ask each group to use digital devices to research the factors they listed.

- Instruct them to find at least two sources of information about osmosis and note down key points.

**Step 3:** Group Discussion

- Bring the class back together.

- Each group will present their findings and discuss how each factor affects the rate of osmosis, fostering a collaborative learning environment.

**Step 4:** Consolidation

- As a class, create a mind map on the board that summarizes the different factors affecting osmosis based on group discussions.

- Students can use flashcards to label parts of the mind map.

**Conclusion (5 minutes):**

- Summarize the key points discussed during the lesson, reiterating the factors affecting osmosis.

- Conduct a quick interactive activity, such as a quiz or a think-pair-share, to reinforce understanding.

- Preview the next session by posing questions for students to think about (e.g., "How do different environments impact osmosis in plants versus animals?").

**Extended Activities:**

- Osmosis Experiment: Conduct a simple experiment using potato slices in different concentrations of saltwater to observe osmosis in action. Ask students to record their observations and discuss the outcomes in relation to the factors affecting osmosis.

- Research Assignment: Encourage students to write a short report on one specific factor affecting osmosis and present their findings in a future lesson.

- Creative Presentation: Allow groups to create posters or digital presentations on osmosis, showcasing the factors affecting it, and display them in the classroom or share them online.

**Teacher Self-Evaluation:**

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**WEEK 11: LESSON 3**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of Cells

**Specific Learning Outcomes:**

**- By the end of the lesson, learners should be able to:**

1. Outline the procedure for demonstrating osmosis using visking tubing.

2. Carry out an activity to demonstrate osmosis using visking tubing.

3. Enjoy carrying out the activity.

**Key Inquiry Question(s):**

- What is a visking tubing?

- How can you demonstrate osmosis using visking tubing?

**Learning Resources:**

- Active Integrated Science textbook

- Laboratory setups with visking tubings

- Distilled water

- Salt solution

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Review Previous Lesson:

- Briefly recap what was learned in the last session about cells and their functions. Encourage students to share relevant points.

2. Discussion of Key Concepts:

- Guide learners to read a short section from the learning resources related to osmosis. Discuss what osmosis is, emphasizing its importance in cells.

**Lesson Development (30 minutes):**

**Step 1:** Understanding Visking Tubing

- Introduce visking tubing as a model for the cell membrane. Discuss its properties and explain how it allows certain materials to pass through.

**Step 2:** Outlining the Procedure

- In groups, learners will outline the steps to demonstrate osmosis using visking tubing. Provide a worksheet with scaffolded questions to help guide their thinking.

**Step 3:** Preparation for Experiment

- Learners will gather all necessary materials (visking tubing, distilled water, salt solution) and prepare their setups for the osmosis demonstration based on their outlined procedure.

**Step 4:** Conducting the Experiment

- Students will carry out the experiment, submerging the visking tubing in salt solution while filled with distilled water. After a set time, they will observe and record any changes. Groups will explain their observations and discuss the movement of water in and out of the tubing.

**Conclusion (5 minutes):**

- Summarize Key Points:

- Recap the steps of the experiment and what was learned about osmosis. Reinforce the significance of osmosis in living organisms.

- Interactive Activity:

- Conduct a quick quiz or game to review key vocabulary and concepts from the lesson on osmosis. For example, "True or False" statements about osmosis.

- Preview Next Session:

- Briefly introduce the concept of diffusion and discuss how it relates to osmosis, preparing students for the next lesson.

**Extended Activities:**

- Research Activity:

- Students can research different examples of osmosis in real life (e.g., how plants absorb water, preservation methods like pickling).

- Demonstration in Nature:

- Encourage students to observe a plant wilting due to lack of water and relate it back to the concepts of osmosis they learned in class.

- Create a Poster:

- Students can create an informative poster explaining osmosis with diagrams and key terms to reinforce their understanding.

**Teacher Self-Evaluation:**

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**WEEK 11: LESSON 4**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of Cells

**Specific Learning Outcomes:**

**- By the end of the lesson, students should be able to:**

1. Outline the procedure for demonstrating osmosis in living things using potatoes.

2. Carry out an experiment to demonstrate osmosis using potatoes.

3. Enjoy carrying out the experiment.

**Key Inquiry Question:**

How can you demonstrate osmosis using potatoes?

**Learning Resources:**

- Active Integrated Science textbook

- Laboratory supplies (Irish potatoes, distilled water, sugar or salt solution)

- Digital devices (for research and recording observations)

**Organisation of Learning:**

**Introduction (5 minutes):**

1. Briefly review the previous lesson on cell structure and function.

2. Introduce the concept of osmosis, discussing how it relates to movement in and out of cells.

3. Allow learners to read and discuss material related to osmosis in potatoes from the Active Integrated Science textbook.

**Lesson Development (30 minutes):**

**Step 1:** Outline the Procedure

- In groups, learners will discuss and create a step-by-step outline on how to carry out the osmosis experiment using potatoes.

- Encourage students to think critically about the materials needed and the processes involved.

**Step 2:** Prepare for the Experiment

- Groups will gather the necessary materials: Irish potatoes, distilled water, sugar/salt solution, and any measuring tools.

- Each group should decide on the concentrations of the solutions they will use.

**Step 3:** Conduct the Experiment

- Students will carefully follow their outlined procedure to perform the osmosis experiment.

- They will place potato pieces in both the distilled water and the sugar/salt solution and note any changes over time.

**Step 4:** Observe and Discuss Findings

- Students will observe the results, focusing on changes in texture, size, and appearance of the potatoes.

- Groups will come together to share their findings and discuss the results related to the concept of osmosis.

**Conclusion (5 minutes):**

1. Summarize key points about osmosis and the experiment they conducted.

2. Engage students in an interactive quiz or discussion to reinforce main topics.

3. Preview the next lesson on the importance of cell transport mechanisms, posing questions for students to think about.

**Extended Activities:**

- Research and present on different types of transport in cells (e.g., diffusion, active transport).

- Experiment at home using different fruits or vegetables to compare osmosis in various plant cells using different solutions.

- Create a poster illustrating the process of osmosis and its significance to living organisms.

**Teacher Self-Evaluation:**

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**WEEK 11: LESSON 5**

**Strand:** Living Things and Their Environment

**Sub Strand:** Movement of Materials in and out of Cell

**Specific Learning Outcomes:**

**- By the end of the lesson, students will be able to:**

1. State the roles of osmosis in living things.

2. Explain the roles of osmosis in living things.

3. Search the internet for information on the roles of osmosis in living things.

4. Appreciate the importance of osmosis in living things.

**Key Inquiry Question:**

- What are the roles of osmosis in living things?

**Learning Resources:**

- Lesson notes

- Active Integrated Science textbook

- Digital devices (tablets, laptops)

- Flashcards

**Organisation of Learning:**

**Introduction (5 minutes):**

- Review the previous lesson on cell structures and functions.

- Guide learners to read and discuss relevant content on osmosis from the textbook and digital resources, emphasizing key concepts such as diffusion and the cell membrane.

**Lesson Development (30 minutes):**

**Step 1:** Introduction to Osmosis

- Explain osmosis as the movement of water across a semipermeable membrane from an area of low solute concentration to an area of high solute concentration.

- Use a visual diagram to illustrate osmosis in plant and animal cells.

**Step 2:** Group Research Activity

- Divide students into small groups and assign each group a digital device.

- Instruct them to use the internet and textbooks to research specific roles of osmosis in organisms, such as water regulation in plants, effect on red blood cells, and overall cellular function.

**Step 3:** Group Discussion

- Have each group discuss their findings with each other, focusing on how osmosis impacts survival and functionality of different cells.

- Encourage them to think critically about how different environments affect osmosis.

**Step 4:** Group Presentations

- Invite each group to present their findings to the class.

- Allow for questions and answers to foster engagement and curiosity.

**Conclusion (5 minutes):**

- Summarize the key roles of osmosis in living things, highlighting insights shared during group presentations.

- Conduct a brief interactive activity like a "Think-Pair-Share" where students reuse concepts learned by discussing with a peer.

- Preview the next session on the importance of turgor pressure in plants and ask students to think about how osmosis could affect plant health.

**Extended Activities:**

- Osmosis Experiment: Have students conduct a simple experiment using potato slices in different concentrations of saltwater to observe osmosis firsthand.

- Creative Poster: Assign students to create a poster that illustrates osmosis and its role in a specific organism (e.g., a plant or animal) to present in the next class.

- Research Project: Encourage students to research a specific condition affected by osmosis, such as dehydration or overhydration, and present their findings.

**Teacher Self-Evaluation:**