

COMMON FORMATIVE ASSESSMENT PLANNING TEMPLATE

--FIRST DRAFT--

Grade Level or Course: 5th-Science

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Assessment Topic: States of Matter and Scientific Inquiry

Selected Power Standards: List standards by number and include the full text here. Then “unwrap” to identify what students need to know and be able to do. Underline the concepts (important nouns or noun phrases) and circle the skills (verbs).

- Identify the three states of matter and their properties.
- Recognize that heating and cooling cause changes in the states of matter.
- Make observations. Ask questions or form hypotheses based on those observations, which can be explored through scientific investigations.
- Design a scientific investigation to answer questions or test hypothesis.

Graphic Organizer of “Unwrapped” Concepts and Skills

Concepts: Need to Know about states of matter and scientific inquiry

- Matter
 - Solids
 - Liquids
 - Gases
- Properties of
 - Solids
 - Liquids
 - Gases
- Changes in states of matter
 - Heating
 - Cooling
- Scientific Inquiry
 - Observations
 - Questions
 - hypotheses

Skills: Be able to Do

(Next to each skill, write number in parentheses indicating approximate level of Bloom's Taxonomy of thinking skills. Refer to Bloom's Taxonomy resource in supporting documents.)

- (1) Identify (states of matter, properties)
- (1) Recognize (heating and cooling causes changes in state of matter)
- (6) Make (observations)
- (6) Ask (questions)
- (6) Form (hypothesis)
- (6) Design (investigation)

Big Ideas from "Unwrapped" Power Standards

1. Heating and cooling can change the state of matter.

2. We learn about something by observing and asking questions that can be tested.

3. Experiments test my hypothesis.

Essential Questions Matched to Big Ideas

1. Can the state of matter change? How does matter change states?

2. How do scientists learn (test hypothesis)?

3. How can you tell if your hypothesis is correct?

SECTION 1: Selected-Response Items—Design multiple choice, matching, true-false, and/or fill-in items to assess student understanding of the following “unwrapped” concepts and skills represented on your graphic organizer. Indicate level of thinking skill in parentheses. *Match assessment items to rigor of skill level.* (Use additional space as needed.)

Match the state of matter to the items listed below. You will use an answer more than once. (IDENTIFY)

- | | |
|-----------------|-----------|
| 1. ____ dust | a) gas |
| 2. ____ oil | b) solid |
| 3. ____ helium | c) liquid |
| 4. ____ snow | |
| 5. ____ balloon | |

Choose the best answer from the choices, a-d, listed below. (RECOGNIZE)

6. When a vapor is cooled and becomes a liquid it is called _____.

- a. vaporization
- b. melting
- c. freezing
- d. condensation

7. When liquid is heated and becomes a gas it is called _____.

- a. vaporization
- b. melting
- c. freezing
- d. condensation

8. An object is a solid if it _____.

- a. changes volume
- b. takes the shape of its container
- c. can flow
- d. keeps its shape and volume

9. An object is a liquid if it_____.

- a. keeps its shape
- b. takes the shape of its container
- c. changes shape and volume
- d. takes the volume of its container

Check all that apply.

10. Circle the sense(s) you would use to make the observation that there is leak in an inflated balloon? (MAKE OBSERVATIONS)

- sight
- smell
- touch
- taste
- hear

11. Circle the sense(s) you would use to make the observation that water is evaporating from a heated pan? (MAKE OBSERVATIONS)

- sight
- smell
- touch
- taste
- hear

12. Give an example of each state of matter for H₂O. (IDENTIFY)

Solid _____

Liquid _____

Gas _____

13. Use the scientific method to show the process you would use to test the question you chose on problem #13?

1. What would you expect to observe in this experiment?
2. Ask a testable question
3. Form a hypothesis

4. Design an investigation to test your hypothesis including the materials you will need and the step-by-step procedure.

14. Which is a testable question that follows the guidelines of the scientific method? (IDENTIFY)

- a. Do people use solids or liquids more often?
- b. Will salt water or tap water heat to 100° C in less time?
- c. Are liquids heavier than solids?

Answer Key:

1. b

2. c

3. a

4. b

5. b

6. d

7. a

8. d

9. b

10. a, c, e

11. a, c,

12. Possible answers solid-ice, snow, sleet, hail; liquid-water; gas-steam or water vapor

13. b

14. Change in temperature and time are both measurable.

15. Answer “a” asks for an opinion and does not specify which solids or liquids. Answer c is too general and does not specify which liquids or solids are being compared

SECTION 2: Extended Constructed-Response—Design an extended-response item to evaluate student understanding of the following “unwrapped” concepts and skills represented on your graphic organizer. Include level of thinking skill in parentheses. *Match item to rigor of skill level.* Evaluate student work using the Task-Specific Scoring Guide below (to be completed).

- (1) Identify (states of matter, properties)
- (1) Recognize (heating and cooling causes changes in state of matter)
- (6) Make (observations)
- (6) Ask (questions)
- (6) Form (hypothesis)
- (6) Design (investigation)

Short answer

14. Explain what makes your answer choice in problem #14 a testable question?

15. Create/describe an experiment that would test a question or hypothesis. Explain why this experiment tests the question.

Task-Specific Scoring Guide:

Exemplary

- All “Proficient” criteria *plus*:
- Complete list of materials
- Clearly stated and organized procedure; easily reproduced
-

Proficient

- Identify testable question
- Make observations
- Form a hypothesis
- Design a scientific investigation to test hypothesis
- Includes vocabulary from unit

Progressing

- Meets 3-4 of the “Proficient” criteria

Beginning

- Meets fewer than 3 of the “Proficient” criteria
- Task to be repeated after remediation

Teacher’s Evaluation_____

Comments regarding student’s performance:

SECTION 3: Short Constructed-Response

Note to Teachers: This portion of the common formative assessment requires students to demonstrate their *integrated* understanding of all the “unwrapped” concepts and skills from the targeted Power Standards by expressing their understanding of the Big Ideas in their own words. Copy your planned Essential Questions (and corresponding Big Idea responses) for your own reference in the space provided.

1. Can the state of matter change? (Yes, heating and cooling can change the state of matter)
2. How do scientists learn about something? (Scientists learn about something by observing and asking questions that can be tested)
3. How can you tell if your hypothesis is correct? (An experiment can test a hypothesis to see if it’s correct)

Student Directions: Write a Big Idea response for each of the following Essential Questions. Include supporting details and any vocabulary terms from the “unwrapped” concepts you have been learning for each response. Your responses will be evaluated using the Generic Scoring Guide below.

Essential Questions Matched to Big Ideas

Answer each essential question with a Big Idea learned during this unit.

1. Can the state of matter change? How? (Yes, heating and cooling can change the state of matter)
2. How do scientists learn about something? (Scientists learn about something by observing and asking questions that can be tested)
3. How can you tell if your hypothesis is correct? (An experiment can test a hypothesis to see if it’s correct)

Generic Scoring Guide:

Exemplary

- All “Proficient” criteria *plus*:
- Makes connections to other areas of school or life
- Provides example(s) as part of explanation

Proficient

- States Big Ideas correctly in own words
- Provides supporting details for each one
- Includes vocabulary from unit in explanation

Progressing

- Meets 2 of the “Proficient” criteria

Beginning

- Meets fewer than 2 of the “Proficient” criteria
- Task to be repeated after remediation

Teacher’s Evaluation _____

Comments regarding student’s performance:

