

# **Vermont-PASS Science Blueprint: Appendix - Grade 5**

## **Preparing for the Vermont-PASS Assessment**

Detailed administration manuals will accompany the Vermont-PASS assessment. However, there are several things that would be beneficial for teachers, administrators and test coordinators to consider ahead of time and are therefore included in this Blueprint. It is also important for test coordinators and teachers who will be administering the assessment to attend pre-assessment training sessions that will be conducted regionally prior to the testing window.

### **Vermont-PASS Test Coordinators**

It is the responsibility of the test coordinator to ensure that all teachers administering the assessment understand the test administration and security procedures. The test coordinator must receive, store in a locked facility, and return all test booklets. The test coordinators will also be responsible for distributing the hands-on materials for the performance task investigations. These materials will be shipped in bulk, and will need to be separated into individual student set ups. In small elementary schools, this task will not be very time consuming. However, in larger schools, particularly high schools, a test coordinator might be dealing with hundreds of student hands-on material sets. It is recommended that adequate time be set aside for this organizational task. Larger schools might also consider utilizing student lab assistants to help organize the hands-on materials.

### **Students**

Teachers are encouraged to share the Vermont-PASS practice tests with their students in order to familiarize them with the components of the test. Teachers might also want to remind students that although scientists frequently work in collaborative groups, students will be asked to work alone on the assessment performance task. This is to provide an accurate measure of what each student knows and is able to do.

### **Teachers**

It is recommended that teachers administering the Vermont-PASS assessment become familiar with the test, particularly the performance task investigation prior to the scheduled administration time. It is also recommended that the performance task be administered in a regular lab or classroom environment. When teachers review the task and materials they can decide if they want to use their customary materials management strategies or devise something different for the Vermont-PASS materials.

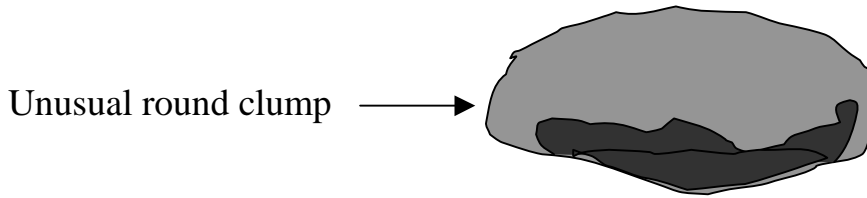
### **Scheduling**

As mentioned above, it is recommended that the performance task be administered in a science lab or classroom environment even if the school needs to combine groups for the other parts of the assessment. This strategy also alleviates problems associated with providing non-supplied materials such as water or eye protection.

Name: \_\_\_\_\_

**Performance Task Grade 5  
“Owl Pellets”**

Jean’s mother asked her to clean out the barn. While doing so she found a pile of unusual round clumps that looked liked they could have come from some kind of animal. She recalled hearing an owl in this area a few nights ago. She remembered learning in school that owls eat small animals, swallow their food whole and spit out what they don’t digest. These clumps are called owl pellets. Jean wondered (hypothesized) if the clumps she found in the barn could be owl pellets. As a fifth grade scientist, you will help Jean support or reject her hypothesis by investigating the unusual round clumps.



1) Predict what these clumps might contain if they are owl pellets? Explain your prediction.

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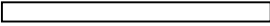



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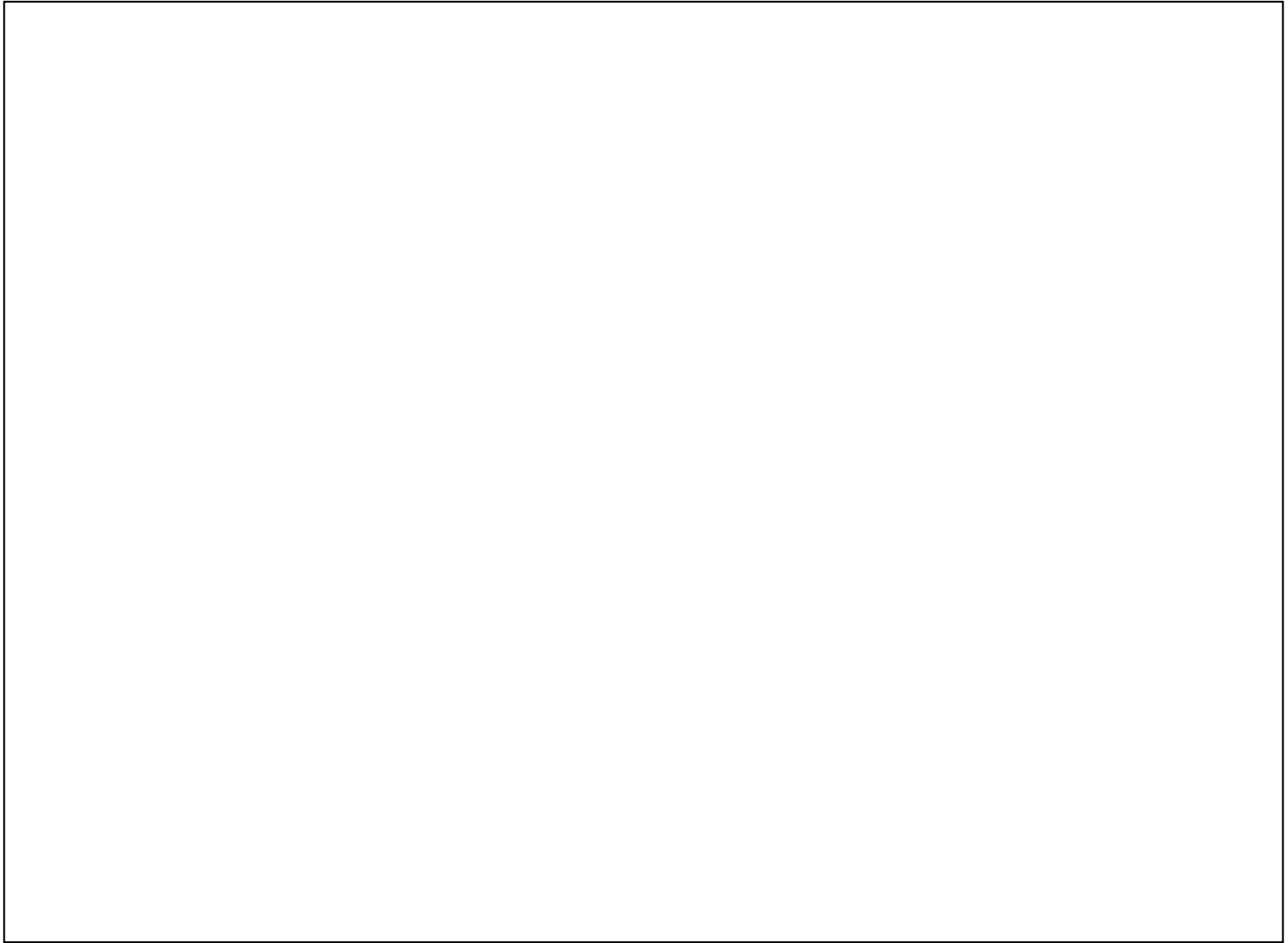
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### Materials For the Experiment

<ul style="list-style-type: none"> <li>• Hand lens</li> <li>• Round clump</li> <li>• Tweezers, probe, or toothpicks</li> <li>• Metric ruler</li> <li>• Tray</li> </ul>	       	<p>Optional:</p> <ul style="list-style-type: none"> <li>gloves</li> <li>warm water</li> <li>paper towels</li> </ul>
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### Objects Found Inside the Clump



4) Do the observations in your charts support your prediction about what you expected to find in the clump? Explain why or why not.

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5) Do the results of your experiment and Jean's observations suggest she was correct in her hypothesis that the clumps are owl pellets? Explain your thinking.

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6. What is an additional investigation might Jean do to collect more information about the unusual round clumps?

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## Vermont-PASS Sample Test

### Grade 5 Performance Task and Alignment With PASS Performance Task Development Template

#### “Owl Pellets”

#### 1. Scenario:

Jean’s mother asked her to clean out the barn. While doing so she found a pile of unusual round clumps that looked like they could have come from some kind of animal. She recalled hearing an owl in this area a few nights ago. She remembered learning in school that owls eat small animals, swallow their food whole and spit out what they don’t digest. These clumps are called owl pellets. Jean wondered (hypothesized) if the clumps she found in the barn could be owl pellets. As a fifth grade scientist, you will help Jean support or reject her hypothesis by investigating the unusual round clumps.

#### 2. Problem Statement:

Are the unusual round clumps owl pellets?

#### 3. Prediction-Hypothesis:

1) Predict what these clumps might contain if they are owl pellets? Explain your prediction.

VT Framework: Living World – 7.13 a., b.  
Inquiry – 7.1 a., c., d., e., f.

NSES: Life Science - 3.1, 3.2  
Inquiry – 1.1, 1.3, 1.4, 1.5, 2.1, 2.2/ 2.4

#### Scoring Guide:

In many experiments, scientists investigate the effect of changing one variable (cause) while keeping other variables constant. For example, a student scientist might want to investigate the effect on the amount of light produced in an electric circuit when the number of batteries in the circuit is increased. In this case, the variable that changes (cause) would be the increased number of batteries. Scientists call this variable the independent variable. The effect of increasing the number of batteries on the amount of light produced is predicted to be “dependent “ on the cause. Scientists call the effect the dependent variable. In the case of the Owl Pellet experiment, students take a slightly different approach to scientific investigation when they are asked to predict, based on prior knowledge (scenario and experience), the kind of evidence they are likely to find if the round objects were produced by a raptor. The results of their investigation will validate the presence of this evidence and lend support to the hypothesis that the round object is an owl pellet or the results will discount that possibility. The ability to analyze and evaluate indirect evidence is a powerful tool in life science as well as the other scientific fields of knowledge.

Key elements: 1. animal remains: bones, fur, feathers etc.  
2. these remains came from what the owl ate.

Score points: 2 points = 2 key elements  
1 point = 1 key element  
0 point = other

#### 4. Experiment:

Materials	
Graphics and Labels:	
<ul style="list-style-type: none"> <li>• Hand lens</li> <li>• Owl Pellet</li> <li>• Tweezers or probe</li> <li>• Metric ruler</li> <li>• Trays</li> <li>• Optional: gloves, paper towels</li> </ul>	Owl pellets can be purchased from most science education supply vendors.

#### 5. Data collection and organization

2) Using the ruler provided, **measure** the length of the clump and record **at least two** observations of the **outside** of the clump.

#### Outside Observations of the Clump

Draw and Label or Write your outside observation here.	Clump Length:   <b>cm</b> _____
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<p><b>Scoring Guide:</b>                  Key elements: 1. Two Characteristics: Color, texture, odor, presence of animal remains, weight in other observable characteristics                  2. within a reasonable length range (2-10cm) (20- 100 mm)</p> <p>Score Points: 2 points= 2 key elements                  1 point= 1 key element</p>
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## 6. Conducting the experiment.

3) Sort the common (most numerous) objects found inside the clump. Make a chart to organize your observations of these objects. Your chart will be titled “Objects Found Inside the Clump”. Make sure these labels are included in your chart:

- Drawings of the Objects
- Count of the Objects
- Description of the Objects

### Objects Found Inside the Clump

**Scoring Guide:**

Key Elements: labels present + observations displayed clearly in row and column format+ at least one entry for each labeled row or column

Score Points: 3 points= 3 key elements

2 points = 2 key elements

1 point = 1 key element

## 7. Use of evidence:

4) Do the observations in your charts support your prediction about the evidence you expected to find in the clump? Explain why or why not.

**Scoring Guide:**

Key Element: Response cites observations from chart as supporting or not supporting prediction

Score Point: 1 point= 1 key element

5) Do the results of your experiment help Jane answer her question about whether or not the clumps are owl pellets? Explain your thinking.

**Scoring Guide:**

Key Element: Response cites observations as evidence to verify or refute the possibility that the clump is an owl pellet.

Score Points: 1 point= 1 key element

6) What is an additional investigation Jean might do to collect more information about the unusual round clump?

**Scoring Guide:**

Key Element: New question or problem addresses additional information regarding the pellet, the animal that produced the pellet or the contents of the pellet **and** information needed to answer the new question can be obtained from research or scientific investigation.

Score Points: 1 point= 1 key element

# Open-ended Questions

**Directions:**

You will be completing two open-ended questions.

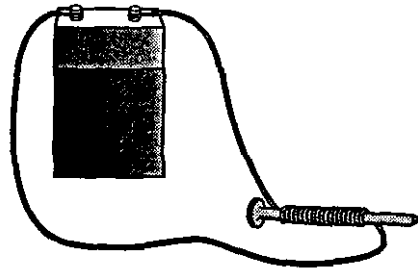
Bill and Jan and the electromagnet  
and  
The Water Cycle

Please read each question and write your answers. Your answers will be judged on

- How well you show your understanding of science; and
- How well you can explain it to others.

Write your response in the space after each question. You may include a picture to help explain your answer.

By hooking up a battery, wire, and nail as shown below, Bill and Jan are able to pick up paper clips with the nail.



Jan and Bill want to experiment with the battery, the wire, or the nail to see whether they can increase or decrease the number of paper clips that their electromagnet can pick up.

- 1) Circle **one** of the three materials listed below that could be changed in a way that would increase or decrease the strength of the electromagnet.

battery

wire

nail

- 2) Write a hypothesis. Predict how a specific change in the material you circled will affect the number of paper clips the electromagnet will pick up and tell why you think that will happen.

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3) Describe what you would do to test your prediction and hypothesis. Include at least four steps in your plan.

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4) Name **one** thing that you would want to keep the same during each trial of your experiment **and** explain why it is important to keep the thing you listed the same.

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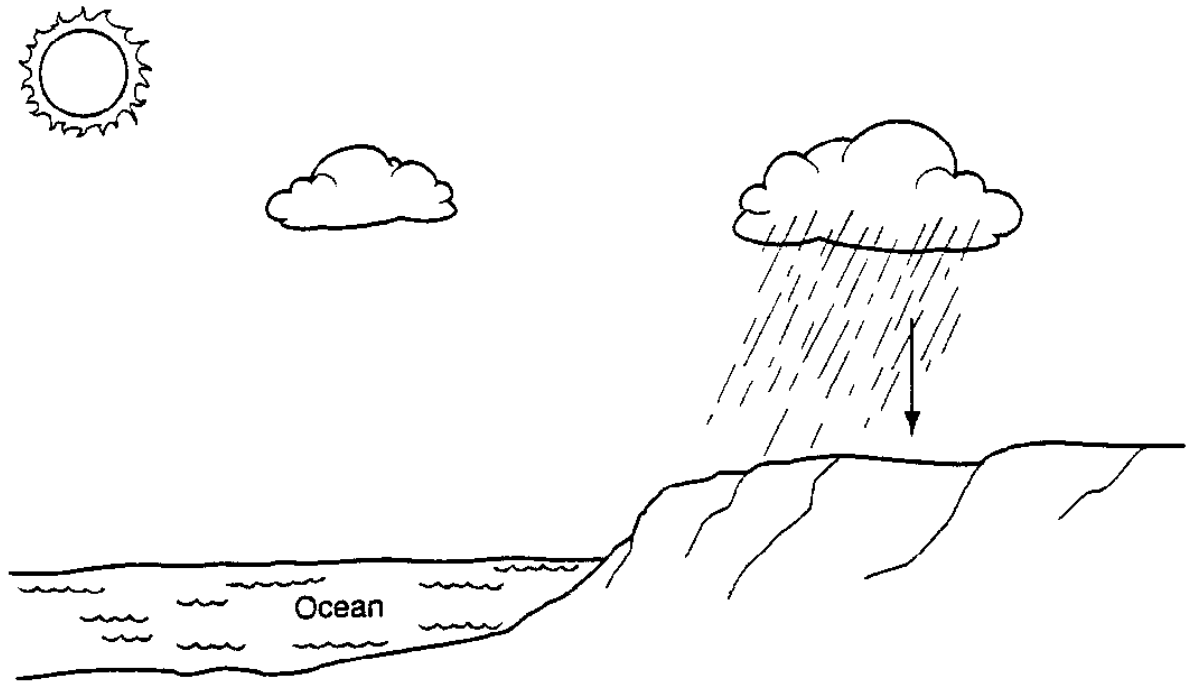
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The diagram below can be used to show the water cycle. The arrow in the diagram shows rain falling to the ground. This is one part of the water cycle.



1) Study the diagram. Describe or draw and label **two** other parts of the water cycle that help make it a complete system.

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2) Describe a part of the water cycle where water changes from a liquid to a gas (vapor).

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What causes this change from liquid water to water vapor?

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3) Waste from human activities may spread through the environment in different ways. Describe how each of the following wastes is spread by some part of the water cycle to a place in the environment where it causes pollution.

- Smoke from a factory

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- Chemicals buried in landfills (garbage dumps)

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## *Vermont-PASS Sample Test* Grade 5 Open-ended Questions

***Bill and Jan and the electromagnet***

VT Framework: Inquiry – 7.1 c.

NSES: Inquiry – 1.2

By hooking up a battery, wire, and nail as shown below, Bill and Jan are able to pick up paper clips with the nail.

Jan and Bill want to experiment with the battery, the wire, or the nail to see whether they can increase or decrease the number of paper clips that their electromagnet can pick up.

- 1) Circle **one** of the three materials listed below that could be changed in a way that would increase or decrease the strength of the electromagnet.

battery

wire

nail

- 2) Write a hypothesis. Predict how a specific change in the material you circled will affect the number of paper clips the electromagnet will pick up and tell why you think that will happen.

**Scoring Guide:**

Key Elements:

- No score points for selecting the material in # 1.
- Prediction contains a proposed variation in one of the materials that constitute the electromagnet, such as:
  - Wire: number of loops/thickness of wire/type of wire
  - Nail: size/kind of nail
  - Battery: voltage of battery/brand of battery
- Prediction regarding how the change in the material will affect the number of paper clips picked up.

Score Points:

2 points = 2 key elements

1 point = 1 key element

- 3) Describe what you would do to test your prediction and hypothesis. Include at least four steps in your plan.

**Scoring Guide:**

Key Elements

- Test the number of paper clips that can be picked up by the electromagnet before any changes are made.
- Change the one material as planned.
- Test the number of paper clips that can be picked up.
- Compare the results.

Score Points:

4 points = 4 key elements

3 points = 3 key elements

2 points = 2 key elements

1 point = 1 key element

- 4) Name **one** thing that you would want to keep the same during each trial of your experiment **and** explain why it is important to keep the thing you listed the same.

**Scoring Guide:**

Key Elements:

- Identifies a variable other than the one selected for change.
- Explains that a change in more than one variable at the same time will produce unclear results.

Score Points:

2 points = 2 key elements

1 point = 1 key element

***The Water Cycle***

VT Framework: Space, Time, Matter – 7.12 b.

Universe, Earth, Environment – 7.15 c., e.

NSES: Physical Science 1.3

Earth and Space Science 1.1

- 1) Study the diagram. Describe or draw and label **two** other parts of the water cycle that help make it a complete system.

**Scoring Guide:**

Key elements:

- Any response relating to run-off/collection/storage of water above or below ground.
- Any response relating to evaporation/sublimation/transpiration
- Any response relating to condensation.
- Any response relating to movement of clouds/air masses.

Score Points:

2 points = 2 key elements

1 point = 1 key element

- 2) Describe a part of the water cycle where water changes from a liquid to a gas (vapor).  
What causes this change from liquid water to water vapor?

**Scoring Guide:**

Key Elements:

- Water in the ocean, lake, ground, plants rises as a gas (vapor) into the air (atmosphere).
- Sun's rays/heat

Score Points:

2 points = 2 key elements

1 point = 1 key element

3) Waste from human activities may spread through the environment in different ways. Describe how each of the following wastes is spread by some part of the water cycle to a place in the environment where it causes pollution.

- Smoke from a factory
- Chemicals buried in landfills (garbage dumps)

**Scoring Guide:**

Key Elements

- Smoke from factory can discharge toxic gasses/matter into the air, mix with water in the air, spread to other areas and fall back to earth in rain.
- Chemicals buried in landfills can seep into aquifers or wells or rivers or lakes etc.

Score Points:

2 points = 2 key elements

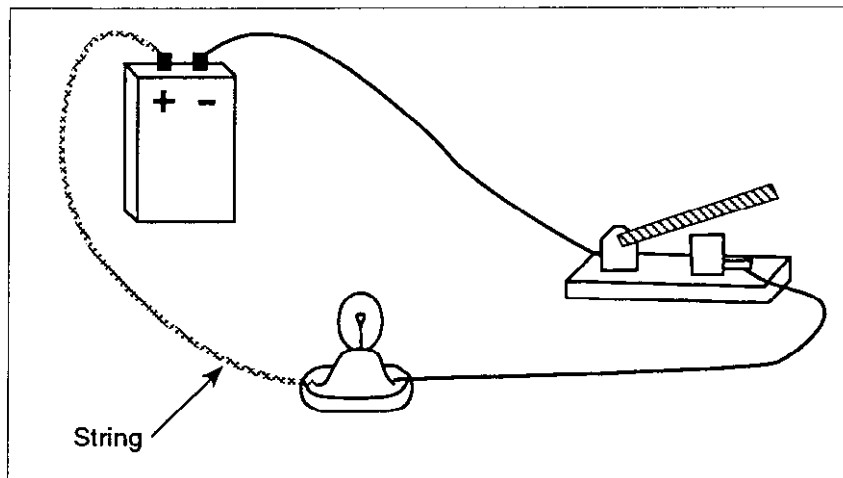
1 point = 1 key element

## Multiple – Choice Questions

### Directions:

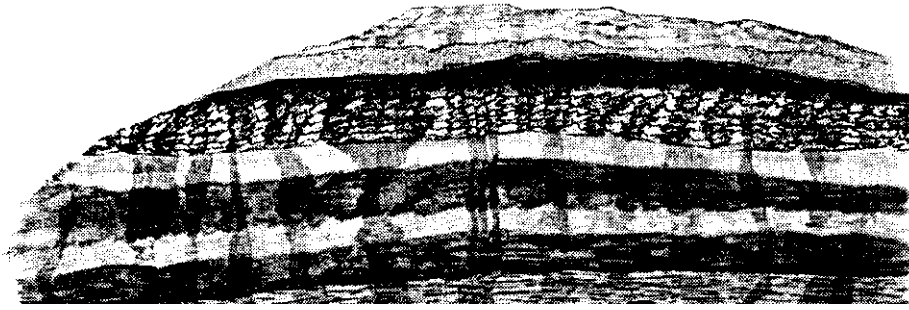
Mark the **one** best answer for each question.

1. Judy wanted to find out whether certain materials were good conductors of electricity. She replaced one of the wires in her circuit with a piece of string.



What will happen to the bulb when the switch is pushed down?

- A. It will blink.
- B. It will not light.
- C. It will shine more brightly.
- D. It will shine less brightly.

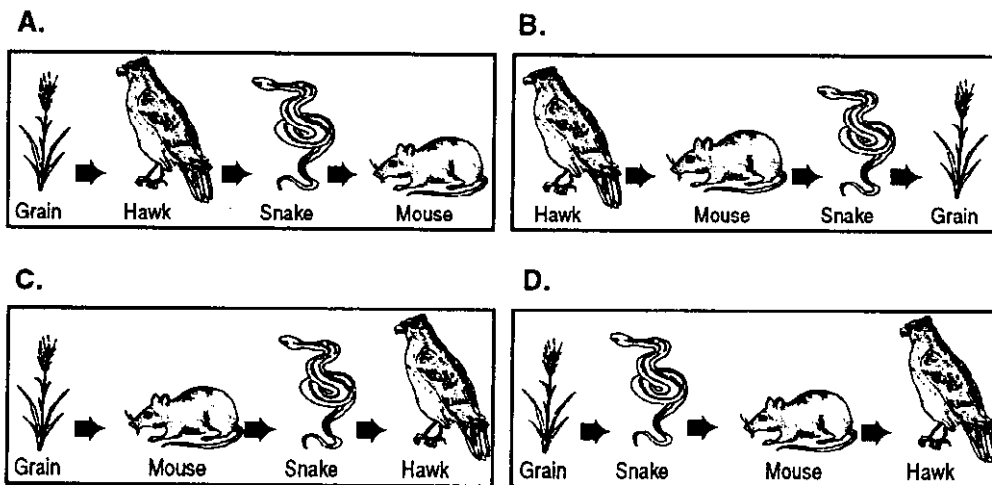


2. The diagram shows layered rock. This type of rock results from

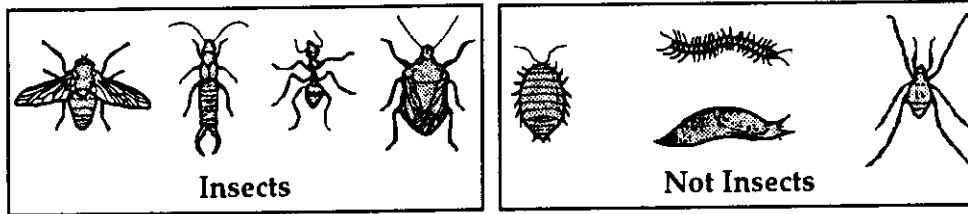
- A. erupting volcanoes
- B. earthquakes
- C. weathering and erosion
- D. meteor impacts

The Martin family went hiking in the woods.

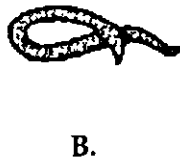
3. On their hike they discussed the flow of energy in the ecosystem.  
Which set of diagrams shows how the energy flows in this ecosystem?



4. Lupe collected some animals without backbones from the school garden. She sorted and classified them into these 2 groups:



Which one of the following is an insect?



## Vermont-PASS Sample Test Grade 5 Multiple-choice Questions

- 1) Judy wanted to find out whether certain materials were good conductors of electricity. She replaced one of the wires in her circuit with a piece of string.

What will happen to the bulb now?

- E. It will blink.
- F. It will not light.**
- G. It will shine more brightly.
- H. It will shine less brightly.

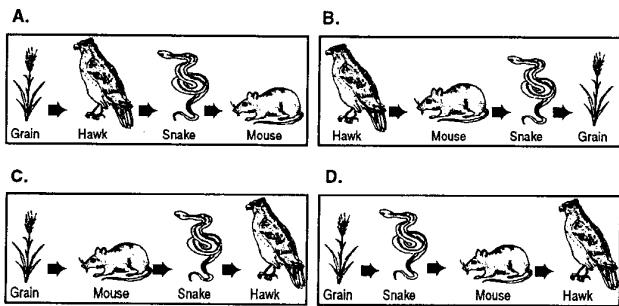
VT Framework: Space, Time, Matter – 7.12 f.  
NSES: Physical Science 3.3

- 2) The diagram shows layered rock. This type of rock results from

- E. erupting volcanoes
- F. earthquakes
- G. weathering and erosion**
- H. meteor impacts

VT Framework: Universe, Earth, Environment 7.15 b.  
NSES: Earth and Space Science 3.1

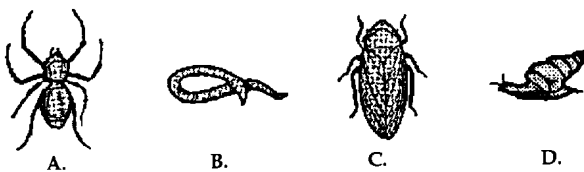
- 3) On their hike they discussed the flow of energy in the ecosystem.



VT Framework: Living World 7.13 c.  
NSES: Life Science 3.1

Which set of diagrams shows how the energy flows in this ecosystem? **C**

- 4) Which one of the following is an insect? **C**



VT Framework: Living World 7.13 b.  
NSES: Life Science 1.2