

Earth's Birthday Project

AMAZING BUGS®



Pre/Post Questions: **Oozing Slime**

Introduction

Pre/Post Questions are tools for guiding inquiry and assessing student learning. Students answer the questions before they do the activities in the Amazing Bugs kit (Pre) and again after the activities are completed (Post).

Students are not expected to score high points the first time they answer the questions. The Amazing Bugs activities will give them many chances to practice the skills needed to improve their answers in the second round.

Contents

Questions are presented on one-page, reproducible handouts. Each handout is followed by easy instructions, including quick prep and a rubric or answer key for grading. Use one or two questions, or all four—the more time you invest, the more students learn and the more opportunities you have for assessment.

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Scheduling, Time, Materials

Schedule the first round (Pre) a few days before you begin the rest of your oozing slime activities. Plan on 10–20 minutes for each question in the first round (Pre), and slightly less time for each question in the second round (Post). The only materials you'll need are two copies of each question, and a pencil, for each student.

Standards and Benchmarks

The teacher's instruction for each question includes New Mexico science and/or math benchmarks.

For more information: earthsbirthday.org/nm

OK to duplicate for use with students!

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Oozing Slime Set Up

Background: Oozing slime is unique form of life and a mystery to scientists. It has no brain, nerves, eyes, nose, ears or mouth, but it seems to have some kind of intelligence.

* * *

Jake and Beth are doing an experiment with oozing slime. They are testing the hypothesis that *slime has some way to “sense” food that is nearby.*

They have two dishes, two small slimes, and a lot of oat flakes. Oats are what slime eats when it is grown in a laboratory.

Jake has already set up the first dish. He placed a small slime in the center of the dish. Right next to the slime, he placed an oat flake. Then he dropped water on the slime and the oat flake until they were soaked.

The second dish should be like the first dish, with only one difference. How should Beth set it up? List three things she should do.

1. _____

2. _____

3. _____

Question 1: Teacher Instruction

Science Benchmarks

- Scientific Thinking and Practice, Standard I, K–4 Benchmark I – Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data; 5–8 Benchmark I – Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.
- Content of Science, Standard II (Life Science), K–4 Benchmark I – Know that living things have diverse forms, structures, functions, and habitats.

Teacher Prep

Make two copies of Oozing Slime Handout Q 1 for each student—one for Pre, one for Post.

Pre (First Round)

Read the handout with students. Make sure that everyone understands the description of the experiment and the question. Do not do too much explaining. Students should try to work out the answer by themselves even if they are unsure how to conduct an experiment.

Allow 10–15 minutes for writing the answer.

Post (Second Round)

Have students complete the handout again after they have done all the Amazing Bugs activities.

Allow no more than 10 minutes.

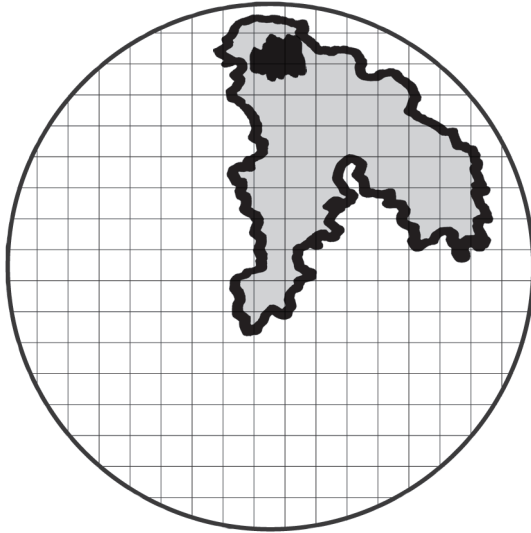
Grading

The maximum possible score is 3 points, one for each of the three items on the list. **Key:**

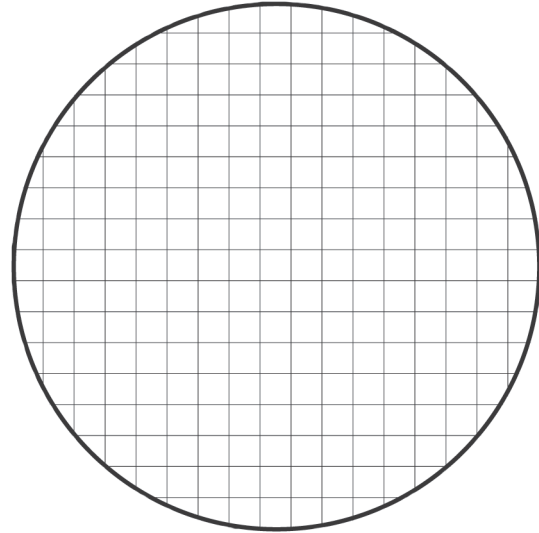
- (1) Place a slime in the center of the dish.
- (2) Place an oat flake a short distance from the slime.
- (3) Drop water on the slime and the oat flake until they are soaked.

Oozing Slime Area

Annette Baca, a fifth-grade student, grew slime in a petri dish. Annette's drawing shows the slime as a light gray area. The solid black shape at the top of the dish is an oat flake that Annette fed to the slime.



Picture 1. Annette's Drawing



Picture 2. Copy of Annette's Drawing

1. Complete the copy of Annette's drawing by adding the oat flake and the slime. The copy should be as nearly exact as you can make it.
2. After you have completed the copy, measure the approximate area of the slime in each picture by counting squares. Count only the squares that are at least half covered by slime. Include the squares that contain the oat flake. Record the numbers on the table.

Picture	Area (squares)
1	
2	

A good way to count: Use a colored pencil (red or orange) with a sharp point to put a tiny dot in each square that is at least half covered. Include the squares that contain the oat flake. Then count the dots.

Question 2: Teacher Instruction

Science Benchmarks

- Scientific Thinking and Practice, Standard I, K–4 Benchmark I – Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data; 5–8 Benchmark I – Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.
- Content of Science, Standard II (Life Science), K–4 Benchmark I – Know that living things have diverse forms, structures, functions, and habitats.

Math Benchmarks

- Measurement 1 – Understand measurable attributes of objects and the units, systems, and process of measurement.
- Data Analysis and Probability 1 – Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Teacher Prep

Make two copies of Oozing Slime Handout Q 2 for each student—one for Pre, one for Post.

Pre (First Round)

Instructions to students: *Read the handout. To answer the first question, complete Picture 2 to make it look just like Picture 1. Then count squares to calculate the areas of the slime in each drawing. A good way to count is to use a colored pencil (red or orange) with a sharp point*

to put a tiny dot in each square that is at least half covered. Include the squares that contain the oat flake. Then count the dots. Record your numbers on the table.

Allow about 20 minutes.

Post (Second Round)

Have students complete the table again, two or three weeks later, after they have done all the Amazing Bugs activities.

Allow no more than 20 minutes.

Grading

The maximum possible score is 3 points.

Key

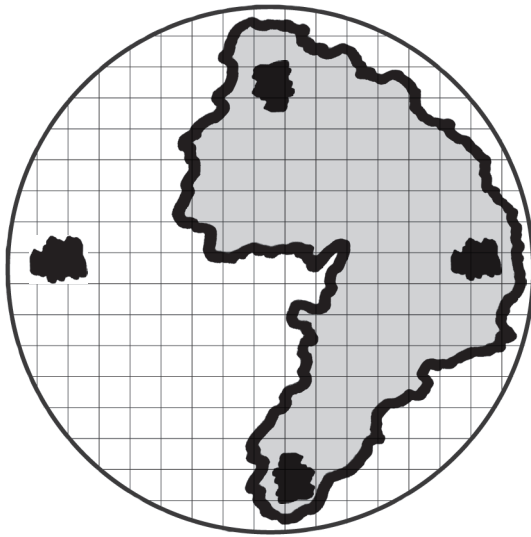
Drawing (1 point): Lay the student's copy on top of an original of Picture 1 as if you were tracing. Hold pages to the light to see if the areas line up. If the student's drawing is roughly correct, score the point.

Area (2 points): Correct answers are shown on the copy of the table, below. Students may find it a little tricky to determine whether some of the squares are more or less than half covered. That's why the key allows for an answer for Picture 1 equal to 44 (the correct amount) plus or minus 3 squares. The area of the slime in Picture 2 should match the area of Picture 1, plus or minus 5 squares to allow for some inaccuracy in the student's drawing. (Some students may infer that the areas should be the same and so may simply copy their answer for the first picture. This is fine.)

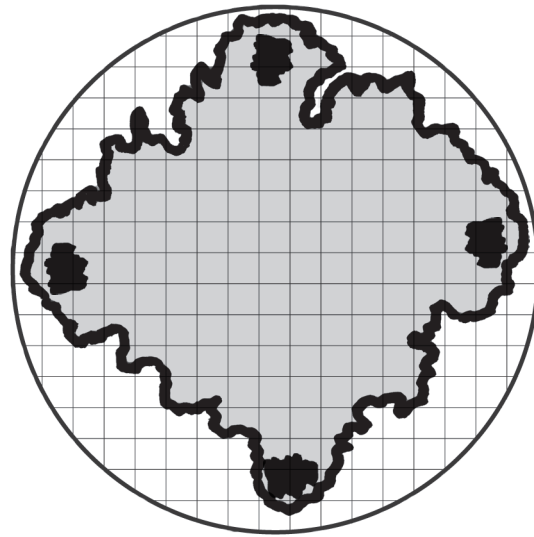
Picture	Area (squares)
1	44 plus or minus 3
2	44 plus or minus 5

Oozing Slime Experiment

Students in Ms. Rose's fifth-grade class grew slime in two petri dishes and observed it for several days. On Day 1, the slime in each dish was about the same size. On Day 5, the dishes looked like the dishes in the pictures. The gray area shows the slime. The solid black shapes are oat flakes the students put in the dishes on Day 1.



Dish 1 – Day 5



Dish 2 – Day 5

1. Describe two ways that the slime in Dish 2 is different from the slime in Dish 1. You do not need to write complete sentences.

A. _____

B. _____

2. Describe one thing that that could explain both of the differences.

Question 3: Teacher Instruction

Science Benchmark

- Scientific Thinking and Practice, Standard I, K–4 Benchmark I – Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data; 5–8 Benchmark I – Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.

Math Benchmark

- Data Analysis and Probability 1 – Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Teacher Prep

Make two copies of Oozing slime Handout Q 3 for each student—one for Pre, one for Post.

Pre (First Round)

Instructions to students: *Read the handout. The pictures show oozing slime grown in two different dishes. Question 1 asks you to list two ways that the slime in Dish 1 is different from the Slime in Dish 2. Question 2 asks you to think of one thing that could explain both of the differences. You will need to think hard to be sure that your explanation is good for both of the differences.*

Allow 10–20 minutes.

Post (Second Round)

Have students answer the questions again, after they have done all of the Amazing Bugs activities.

Allow no more than 10 minutes.

Grading

The maximum possible score is 3 points.

Key

Question 1 (1 point for each of two answers, A and B, in any order)

The slime in Dish 1 is smaller than the slime in Dish 1.

The slime in Dish 1 has reached only 3 oat flakes, while the slime in Dish 1 has reached 4.

Question 2 (1 point)

Good possible explanations include:

- The slime in Dish 1 is growing slower and hasn't had time to reach the fourth oat flake; or
- In Dish 1, there is some kind of invisible barrier between the slime and the fourth flake, and because it has less food it hasn't grown as much; or
- The fourth oat flake is no good (different from the other three), and because the slime has less food it hasn't grown as much.

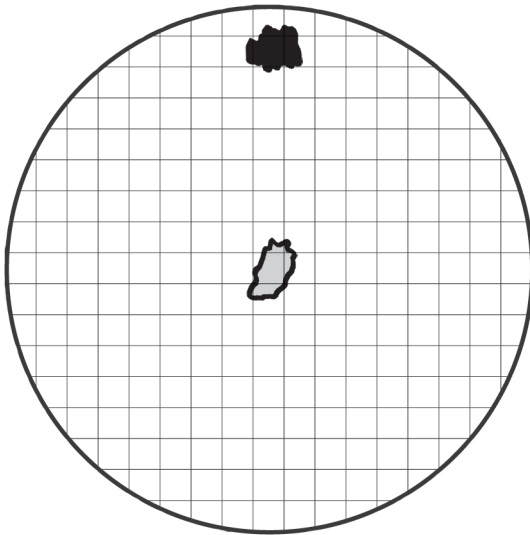
Students may come up with different ideas, but they must explain both that the slime hasn't reached the fourth flake and that it is smaller. Use your judgment to determine whether the student has earned the point.

Oozing Slime Prediction

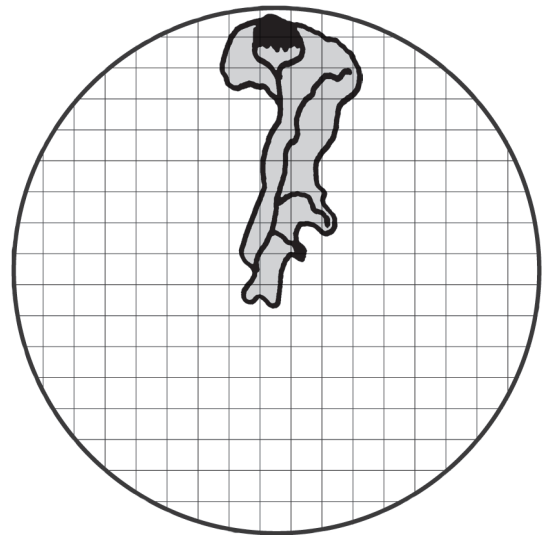
Annette Baca, a fifth-grade student, grew slime in a petri dish. She wanted to know how it would grow. Would it grow towards its food? Or, would it grow in several directions at once?

Annette started with a small amount of slime in the center of the dish. She placed an oat flake at the top of the dish. She made a prediction. *On Day 3, she saw that her prediction was correct.*

Annette's drawings of the dish on Days 1 and 3 show the slime as a gray area. The solid black shape at the top of the dish is the oat flake.



Oozing Slime – Day 1



Oozing Slime – Day 3

What do you think Annette predicted? Compare the two drawings. Based on what you see, write the prediction on the lines below.

Question 4: Teacher Instruction

Science Benchmark

- Scientific Thinking and Practice, Standard I, K–4 Benchmark I – Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data; 5–8 Benchmark I – Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.

Math Benchmark

- Data Analysis and Probability 1 – Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Teacher Prep

Make two copies of Oozing Slime Handout Q 4 for each student—one for Pre, one for Post.

Pre (First Round)

Instructions to students: *Read the handout carefully. The question is challenging, and you will have to give it some thought before you start writing. The introduction says that on Day 3, Annette saw that her prediction was correct. Based on the change in the slime, as shown in the drawings for Day 1 and Day 3, what do you think her prediction was?*

Allow 10–15 minutes.

Post (Second Round)

Have students complete the table again after they have done all of the the Amazing Bugs activities.

Allow no more than 10 minutes.

Grading

The maximum possible score is 2 points. Use the rubric below for grading.

Annette's Prediction: (1) The slime will grow in the direction of its food [the oat flake]. (2) It will reach the food before it grows in other directions.	
Score	Description
2	The student's answer matches Annette's prediction exactly, in content if not word for word.
1	The student's response matches only half of Annette's prediction, (1) or (2)
0	The student's response does not match either part of Annette's prediction.