Creatures from Omicron

This science activity is designed for students in grades four through eight. It can be presented by teachers with no special preparation in science. "Creatures From Omicron" is keyed to some of the concepts in the planetarium program, "The Red Planet Mars," so it will probably be most effective if presented just before or just after visiting the planetarium. Each teacher may wish to adapt the language and pace of the activity to his or her particular class.

Objectives

The primary objective is for the students to learn how exobiologists work with limited information to imagine what life may be like on other planets. After the lesson, the students will be able to:

1. Invent life forms which are adapted to their environments.
2. Recognize that several observers may notice different aspects of the same object or event.
3. Recognize that hypotheses are ideas which can be tested by further observation.
4. Recognize that scientists make hypotheses based on partial information. Sometimes these turn out to be right, and sometimes they are found to be wrong.

Before the Lesson

1. Assemble the following materials for each student: two large sheets of paper, magic markers or crayons and a copy of one of the three Creature photos on pages 3–5. One third of the class gets copies of photo 1, another third of the class gets photo 2, and the remaining students get copies of photo 3. For example, if there are 30 students in your class, you will need 10 copies of each creature photo.
2. Clear three large areas on the blackboard or wall on which to display the students' work.
3. On the blackboard, write:

   Omicron has:

   a. Very sandy soil.

   b. Moist, foggy atmosphere.

   c. Very dim light.
4. Prepare three working areas within the room or in adjoining rooms. The students in each area must be able to draw without seeing the work of students in the other groups.

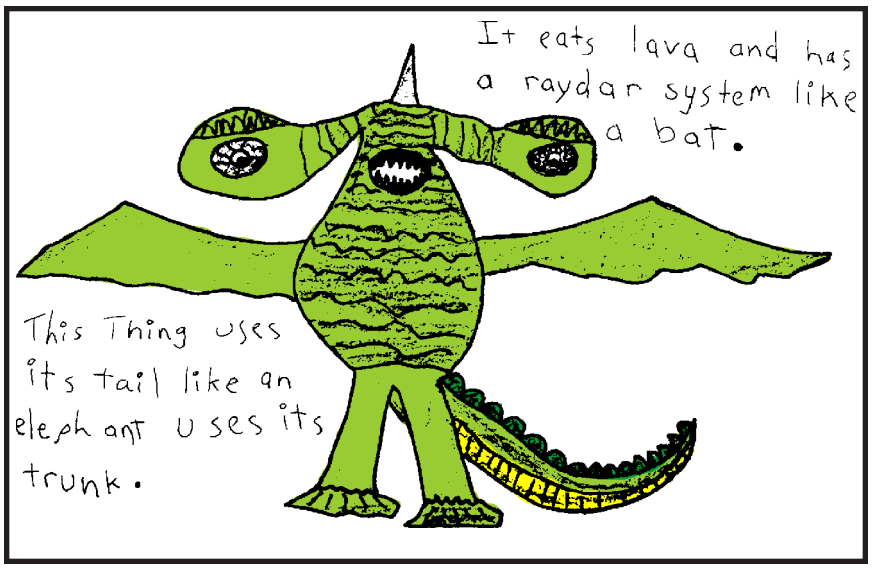
Part A. Exploring Omicron

Today's activities will help you discover what it is like to be an exobiologist. That is a scientist who studies the possibility of life in the universe beyond Earth. Each team is to pretend it is exploring the planet Omicron, circling a distant star. Omicron has: a) very sandy soil, b) moist foggy atmosphere, and c) very dim light.

What do you think each of these conditions would mean for the creatures of Omicron?

Indicate the list of conditions written on the board. Have the students discuss their own experiences of similar conditions on Earth. What adaptations would a creature need to survive in such conditions?

Each team of exobiologists will receive a picture that was taken during the exploration. Since most of the creature was hidden by the fog, your job is to draw what you think the whole creature might look like. Be sure it has specific features to allow it to survive under the conditions of Omicron. Under your drawing, please explain what features your creature has to enable it to survive.



After giving the assignment, distribute paper and crayons or markers. Have the students sit in three assigned team areas. Give the students in each team the same creature picture. Be sure they do not see pictures given to the other teams. Allow five to ten minutes for the students to finish. Have the students post their work on the blackboard or wall next to the work of their teammates. Students should still not have seen the other teams' original posters. When all of the invented creatures are posted in three groups, begin the discussion.

Look at the creatures in the first group.

How are they similar?
What do you think these exobiologists saw?
How are these drawings different from each other?
What might explain the differences?
Would anyone in the first team like to tell us how your creature is adapted to the conditions of Omicron?
Do any of the creatures look like Earth creatures? [e.g., two eyes, one tail]
Would creatures on another planet necessarily be like us? What are some of the most imaginative creatures?

Have the students discuss their answers to these questions. Then, move on to the second group of drawings and ask the same set of questions. Repeat for the third group of drawings. At the end of each discussion, display the photo seen by that team. Then, hand out the second sheet of paper and give the last assignment.

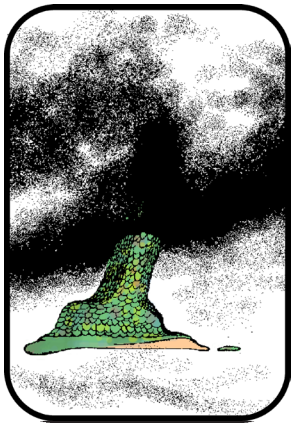


Photo 1

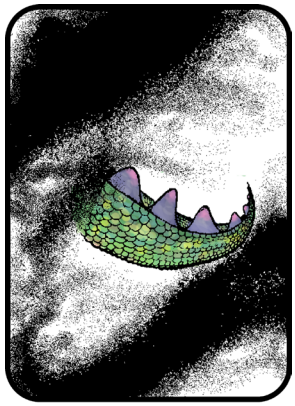
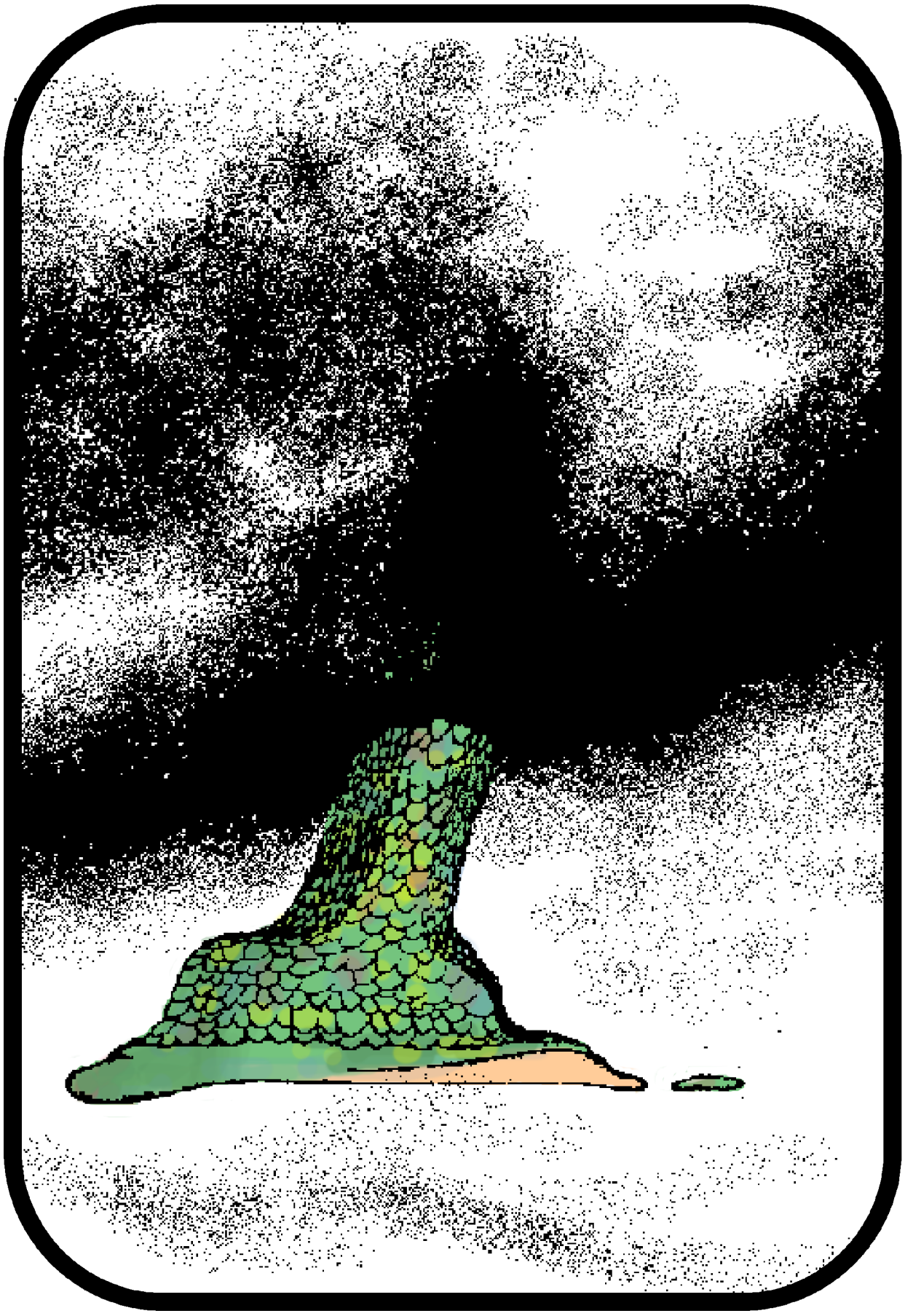


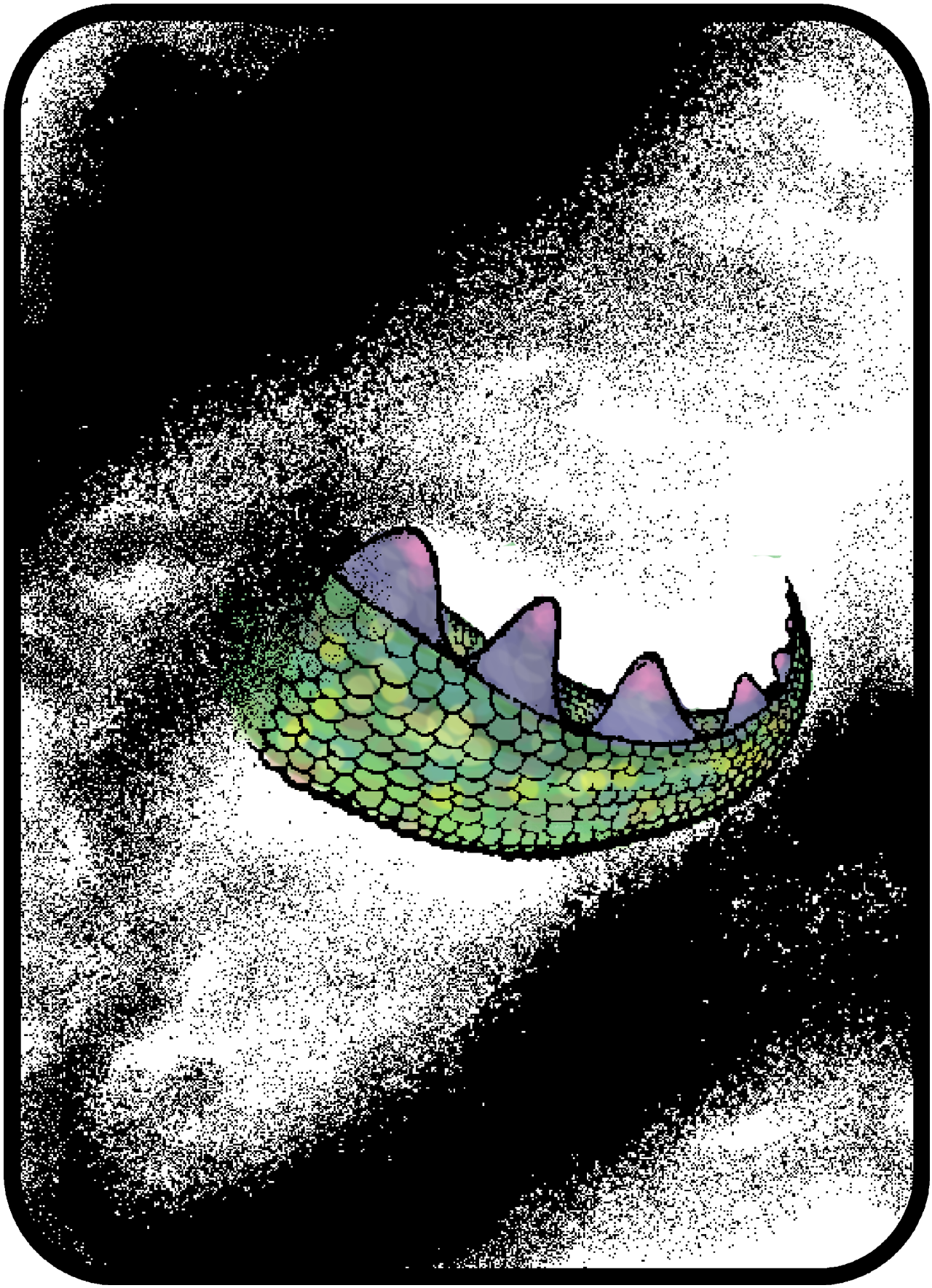
Photo 2


Photo 3

Omicron Creature Photo 1



Omicron Creature Photo 2



Omicron Creature Photo 3

Part B. How Does Your Creature Survive?

Now that you have more information about the creature, and have heard about some possible adaptations, make one final drawing which shows your best guess as to what the entire creature looks like. Label your drawings to explain the features of your creature that help it survive under all three conditions.

Allow five to fifteen minutes for the students to finish. In the meantime, take down their first drawings to make room for the final drawings. As the students finish, they post their new work on the board. (Drawings need not be grouped in teams for this third round.)

Can you see more similarities this time? What are they? Who would like to tell us how your creature is adapted to life on Omicron?

Focus the second discussion on the students' ideas about how their creatures survive under the conditions of Omicron. End with a discussion about how the students' ideas (hypotheses) could be tested on the next expedition to Omicron.

Follow-Up Activities

1. "Creatures from Omicron" can serve as an introduction to life science activities concerned with adaptations to the environment. For example, the Outdoor Biology Instructional Strategies (OBIS), "Invent An Animal," would be good to do before or after this lesson (OBIS activities are available from Delta Education, Inc., P. O. Box M, Nashua, NH 03061, 800-258-1302).
2. "Creatures From Omicron" can also serve as the starting point of a language arts activity. The students could write stories about the creatures, describing their means of obtaining food, their houses and social behaviors, the extent of their intelligence and civilizations, interactions with other plants and animals, and so on.
3. In relation to a social science activity, this lesson could lead to a discussion about how different historians report on the same set of events.
4. For grades 7 and up, the computer program *Planetary Construction Set* (Sunburst Communications, 101 Castleton St., Pleasantville, NY 10570-3498, 800-628-8897) offers a simulation of creating a planet to meet the needs of a specific alien.

Astronomy Quiz

The quiz which follows may be used as a pre-test or post-test. Please note that some questions refer to "Simulating the Solar System" while others refer to "Creatures from Omicron" or Red Planet Mars. You should revise this test as needed to fit your particular classroom situation.

Answers to the Astronomy Quiz: Planets

1 False
2 True
3 False
4 True
5 (dot on lower right of Picture C)
6 D
7 (look for at least one feature designed to help survival under each of the three conditions)
8 C
9 B
10 C