

CASE OF THE ROOM 116 BLOB: TEACHER GUIDE

Subject: Life Science

Grade Level: Middle School; easily adapted to Elementary School

Last Updated: March 5, 2008

Case Summary

Two unsuspecting students encounter a strange substance one day as they enter their classroom. Everyone thinks they know what it is...but do they? Is it harmful? Or more importantly...is it *alive*?

Credits

This case was written by Amanda Hillman (PhD student, Anthropology, Emory University, Atlanta, GA) with input from Emilie Farmer (teacher, Chamblee Middle School, Atlanta, GA) fellows of the Emory University PRISM program (<http://www.prism.emory.edu>). Author may be contacted at ahillm2@emory.edu

Learning Objectives

This mystery about a strange, unknown substance combines the application of the scientific method with basic principles of Life Science.

Students will be able to:

1. Classify objects as living or nonliving based on the standard characteristics of living things: being composed of cells, reaction to the environment/stimuli, reproduction, possession of DNA, growth and development, excretion of waste, and consumption of nutrients/energy.
2. Exercise appropriate lab safety measures for handling and observing substances
3. List and explain the steps of the scientific method
4. Utilize the scientific method to guide inquiry
5. Predict whether or not a creature/object might survive certain conditions

Georgia Performance Standards

S7CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works. (NSES Content Standard A)

S7CS2. Students will use standard safety practices for all classroom laboratory and field investigations. (NSES Content Standard A)

S7CS7. Students will question scientific claims and arguments effectively. (NSES Content Standard A)

S7CS8. Students will investigate the characteristics of scientific knowledge and how that knowledge is achieved. (NSES Content Standard A)

S7CS9. Students will investigate the features of the process of scientific inquiry. (NSES Content Standard A)

S7L1. Students will investigate the diversity of living organisms and how they can be compared scientifically. (NSES Content Standard C)

Assessment

Mandatory Product: Students will devise a field guide for testing if something is living or not

Elective Products: Students may draw or design a new “thing” and provide classmates with a couple clues about it. Class will use knowledge of life characteristics to determine if it’s living or not.

Students may draft a lab report about their testing of the Blob for living characteristics.

Students may complete Ms. Shizzle’s Chart

Students may hold a debate/discussion- what makes something a living thing?

Students may complete a T-Chart of living/nonliving things while watching the slideshow

	Poor	Satisfactory	Good	Excellent
Content Mastery: Characteristics of Life	Student has no or only rudimentary understanding of COL	Student can name five of the seven COL and provide examples	Student can name all seven COL and provide examples	Student can name all seven COL, provide excellent examples, and infallibly classifies objects/substances as living/nonliving
Content Mastery: The Scientific Method	Student has no or only rudimentary understanding of the SM	Student can name all five steps of the SM	Student can name and describe all steps of the SM	Student can name and effectively apply all steps of the SM
Scientific Inquiry				

Elective Product				
Mandatory Product	Student fails to complete Field Guide	Student completes field guide with only minimal attention to detail	Student completes a detailed field guide that is accurate	Student completes a field guide that is detailed, accurate, well-presented, and encompasses all covered characteristics of life
Participation	Student refuses to participate in class discussion when called upon	Student actively participates in activities voluntarily	Student actively participates voluntarily with interest	Student actively participates with interest and enthusiasm, and encourages participation of others
Cooperation	Students refuses to cooperate with others	Student cooperates with others	Student actively cooperates with others and shares responsibilities fairly	Student actively cooperates, encouraging group cohesion and sharing responsibilities fairly

Implementation Strategy

This case has four shorter scenes, and can be done using four class days. Students were already familiar with some of the basic characteristics of life, so this case can serve as either an introduction or a great review. The length of time this case takes will depend on the amount of research students will need to do.

Case Notes

The students were crazy about finding the blob waiting for them in the classroom and were *very* eager to investigate it. Take advantage of this opportunity to review proper lab safety techniques.

Facilitator Guide:

Scene One- Two girls, Hoang and Tamika, arrive early to their Life Science class to study, but are surprised by a mysterious white substance sitting on a table. They are unsure what it is, if it is alive or not, or where it came from. Despite Hoang’s warnings not to do so, Tamika is eager to investigate it before taking safety precautions.

Facts	Hypotheses
<ul style="list-style-type: none"> -There’s about to be a quiz in Life Science class -There is a mass of “stuff” on a tray, it is white -The thing is not moving -Coral lives but does not move -Hoang doesn’t think Tamika should touch it with her bare hands 	<ul style="list-style-type: none"> -If the girls poke it, it might move -Somebody left this out after an experiment -It’s alive -It’s not alive -Tamika will get hurt if she touches it -Tamika thinks she’ll be fine if she touches it with her bare hands
Interview Questions	Learning Issues
<ul style="list-style-type: none"> -Is the thing moving? -Is it breathing? -Is it alive? -Is it making noise? 	<ul style="list-style-type: none"> -How do we know if something is alive? -What are we supposed to do when touching something that we can’t identify? -What is coral?

Guide Questions:

- What would you do if you found this strange thing in your classroom? Why?
- What do you think about Hoang’s reaction?
- Do you think this substance is alive? What else would you want to know to be able to make that decision?

Introduce students to actual “blob” here. Students will research the above learning issues. A culminating whole-group activity will be to view a number of slides (in a Flash video) that show living and non-living things, and classify them into T-charts in their groups.

Scene Two- The girls are interrupted when Ms. Shizzle suddenly appears in the room. Hoang and Tamika are in conflict about what Tamika was just about to do. Ms. Shizzle mentions the need to follow the scientific method, and also to adhere to lab safety standards. The girls are left with Ms. Shizzle’s question: What does it mean for something to be alive?

Facts	Hypotheses
-Ms. Shizzle caught the girls as Tamika was about to touch the mystery creature -Hoang and Tamika almost argue -Ms. Shizzle says they have to follow the scientific method -Ms. Shizzle says they have to use lab safety equipment -The girls want to know if the thing is alive	-Ms. Shizzle will show them if it’s alive or not -Tamika won’t be mad at Hoang, and won’t get in trouble -Tamika almost got hurt -The class will figure it out -The class will use the scientific method -Ms. Shizzle will give them some equipment
Interview Questions	Learning Issues
-How did the thing get in the classroom? -What did Ms. Shizzle use to move it, if she did?	-What is the proper lab safety equipment? -What is the scientific method? -What does it mean for something to be alive? What are the characteristics of living things?

Guide Questions:

- What is safety equipment? (any kind- construction, medical, etc.) Where have you seen it, and what does it consist of?
- Do you think the girls need any equipment to examine the “thing”?
- What do you think Ms. Shizzle means by “the scientific method?”
- Now that you’ve read a bit about the characteristics of living things, how would you decide if the “thing” is alive or not?

Activity- students will design a test protocol to see if the “thing” is alive. After the next scene, students will implement it and come to a conclusion. Students will also report on any information found regarding the scientific method.

Scene Three- Before the scheduled quiz, Ms. Shizzle takes a moment to hear what the class knows about living things. She draws a chart on the board about the characteristics of living things and a brief discussion ensues. The students learn that they will be able to apply their own tests of living/nonliving criteria.

Facts	Hypotheses
-Living things have to be breathing -Living things must reproduce -Living things must eat -Nick doesn't think it's alive because it doesn't have a mouth to eat -Some germs are live, but viruses are not	-The blob is/is not alive -The class will find out if it's alive using the characteristics of living things -Ms. Shizzle might let them get out of the quiz if they do a good job
Interview Questions	Learning Issues
-Has Ms. Shizzle given anything to the blob, including food or water? -Is the blob growing?	-What is a microorganism? -What kinds of germs are alive? -What is a virus? Why aren't scientists sure if it's alive or not? -Why do living things have to eat? How can they eat without a mouth? -What does it mean to reproduce? -Why do living things have to breathe?

Guide Questions:

- Think of different things that you know are alive. What do they have in common?
- If they're alive, how do plants "eat" and "breathe?"
- Can you think of any germs that might be alive? What does Listerine or antibacterial soap claim to do?
- What else would you add to fill in Ms. Shizzle's chart?

Activity- Students will test their ideas about the blob. **IMPORTANT-** to facilitate this, have the students write down the following questions and answers:

- What do I know about this blob already?
- What do I think will happen when I do _____?
- What is happening while I'm doing _____?
- What does what happened say about my prediction? Was I correct?
- What have I learned from doing _____? Now that I know this, what do I plan to do next?

Choose one or two groups' examples to display in larger format during discussion. Be sure to collect, or have the students keep, these charts for an activity following Scene Four.

Scene Four-

Facts	Hypotheses
<ul style="list-style-type: none"> -Students got to Ms. Shizzle’s class early -The class wants to know about the Scientific Method -The Scientific Method helps us organize scientific inquiry -science is a step by step process -the class got to feel like true scientists 	<ul style="list-style-type: none"> -The class might already know something about the scientific method -if you don’t use it, your work will not be credible -The class is eager to test this out
Interview Questions	Learning Issues
<ul style="list-style-type: none"> -Where did Nick learn about the Scientific Method already? -Why does science have to be a step by step process? -what is scientific inquiry? -How does the class already know about it if they don’t know what it is? 	<ul style="list-style-type: none"> -What is the Scientific Method? What are the steps? Why are they necessary? -How can we use the Scientific Method? What is it for? -Does everyone use the same scientific method? -What does it mean for work to be credible?

Guide Questions:

- Why might it be a good idea to organize our scientific thoughts?
- Has anyone heard about the Scientific Method? What steps can we name and what does each involve?

Activity- Using the students’ notes from the previous exercise, have students go through each step of their notes. Explain that each step corresponds to a different step of the SM:

- What do I know about this blob already? (Background Info, Gathering Information)
- What do I think will happen when I do _____? (Hypothesis)
- What is happening while I’m doing _____? (Data)
- What does what happened say about my prediction? Was I correct? (Analysis)
- What have I learned from doing _____? Now that I know this, what do I plan to do next? (Conclusion)

Resources

Materials:

IVORY soap, plain (no substitutions!)

Microwave

Tank or bowl

paper

TO MAKE THE BLOB: Break up a bar of plain *IVORY* soap into small pieces, using about half of one bar or less. Place on a dry paper towel and microwave for about 20 seconds, monitoring the soap. It should begin to puff up. If solid chunks of soap still remain, continue to microwave for about 15 seconds at a time until it no longer grows.

Information Resources:

Science Textbook

Reference materials available (encyclopedias, dictionaries, magazines)

WGBH Educational Foundation. (2007). The needs of living things. Retrieved December 4, 2007 from www.teachersdomain.org/3-5/sci/life/colt/lp_stayalive/index.html

WGBH Educational Foundation. (2007). Unity of life. Retrieved December 4, 2007 from www.teachersdomain.org/6-8/sci/life/div/lp_lifeunity/index.html