

# The Rock Cycle

## Goals

In this activity you will:

- § Identify the three major types of rocks.
- § Explain how igneous, sedimentary, and metamorphic rocks differ.
- § List the forces that power Earth's rock cycle.
- § List the processes by which rocks are formed and broken down.
- § Describe the rock cycle.



## Think About It

Interactions among Earth's water, air, and land can cause rocks to change over time from one type to another. This continuous process that causes rocks to change is the rock cycle.

- § What factors or processes cause rocks to change?
- § Is it possible to observe geologic changes on Earth? Explain your answer and provide an example to support your reasoning.

What do you think? Record your ideas about these questions in your notebook. Be prepared to discuss your responses with your small group and the class.

## Investigation

*Each group will need:*

- § safety goggles
- § craft sticks
- § scrap paper
- § aluminum foil
- § eight wax crayons (2 crayons of 4 colors)
- § tongs
- § hot plate (plate covered in aluminum foil)
- § 2 wood blocks (*about 2.5 x 12.5 x 20 cm*)

### Part A: Breakdown of Rocks

1. Use the craft sticks to shave the crayons onto a scrap piece of paper. Keep all the shavings of each color in its own pile.
2. Examine the shavings and record your observations.

*If the shavings must be stored until the next class session, place each pile in its own envelope. Label the envelope with your period and table number.*

3. Assuming the crayons represent rocks, what part of the rock cycle is being simulated by the shaving of crayons? (use the rock cycle diagram to help you answer)

### Part B: Layering of Sediment

4. Obtain a piece of aluminum foil about 15 x 30 cm.
5. Place one color of the crayon “rock” fragments in the middle of the aluminum foil. Spread the shavings into a square layer approximately 1 cm thick.

6. Carefully spread another color of “rock” shavings on top of the first layer, forming a second layer. Do this with each remaining color so there is a four-layer stack of crayon rock fragments in the middle of the foil rectangle.

7. What part of the rock cycle does this step represent? (again use the rock cycle diagram)

### Part C: Pressure Applied to Rocks

8. Carefully fold each side of the aluminum foil over the stack of rock fragments, allowing for a 1 cm gap between the edge of the shavings and where the foil folds.

9. Place the foil package between the two blocks of wood, and place this “sandwich” on the table. *See diagram.*



Apply moderate pressure by pressing it together with your hands.

10. What part of the rock cycle does this represent?
11. Remove the foil package from between the two boards, carefully open it. Record your observations. Has the material been compressed? Has it been formed into a single “rock”?
12. Place the rock fragments back into the foil and refold the package.
13. Place the foil package back between the two boards and apply as much pressure as you can by standing on it (not jumping).
14. What part of the rock cycle does this represent?

15. Open the foil package and examine the newly formed “rock.” Break the “rock” into several pieces and record your observations.

#### **Part D: Heat Applied to Rocks**

16. Take a new piece of aluminum foil about 15 x 30 cm and fashion it into a melting bowl large enough to contain the rock fragments from Part C. *See picture.*



17. Place the contents of the first foil package into the bowl.

***Before proceeding, make sure you have on your safety goggles. Handle the hot plate and melted crayon fragments with extreme care!***

18. Make sure the hot plate is completely covered with aluminum foil, and then set it to medium temperature. Place the foil melting bowl on top of the hot plate and melt the rock fragments. Be careful to melt them slowly enough to keep the fragments from spattering, and stop the melting process before the fragments fuse completely together.

19. Turn off the hot plate, *but remember that it will still be hot for a while longer before it cools!* Use the tongs to carefully remove the bowl from the hot plate and set it aside to cool for about ten minutes. *Be extremely careful not to spill the molten rock fragments on anyone or anything!*

20. What part of the rock cycle does this step represent?

21. Once the rock has thoroughly cooled, remove it from the bowl. Break it open, examine it, and record your observations.

#### **Part E: Questions and Conclusions**

22. Name and describe the parts of the process by which rocks break down. At what stages of this activity did each occur?

23. There are 2 types of igneous rock. Do some research to determine what these types are, how they are formed and how they differ.

24. Briefly explain how this activity relates to the rock cycle.

25. Add a drawing of the rock cycle to your notes.

#### **Digging Deeper**

Follow this link: [Interactive Rock Cycle](http://www.learner.org/interactives/rockcycle/index.html)  
(<http://www.learner.org/interactives/rockcycle/index.html>)

Work your way through the website to the test. You may take this test as a group. Enter all of your first names then take the test and print your results.

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