

Mollie Magma

Overview:

During this lesson students will use visual aids to understand that as new ocean crust is formed at mid ocean ridges, old crust is pushed into ocean trenches, where it melts to become magma, then returns to Earth’s mantle.

Objectives:

The student will:

- identify the temperature of a material at each stage along the mid ocean ridge-to-trench cycle;
- identify the material as magma, lava, or crust at each stage along the mid ocean ridge-to-trench cycle; and
- identify the location of the material as it moves through the mid ocean ridge-to-trench cycle.

Materials:

- Paper fastener
- Scissors
- Student Information Sheets: “Mollie Magma Cycle Wheel” (if desired, copy on to card stock for more stability)
- Student Worksheet: “The Many Stages of Mollie”

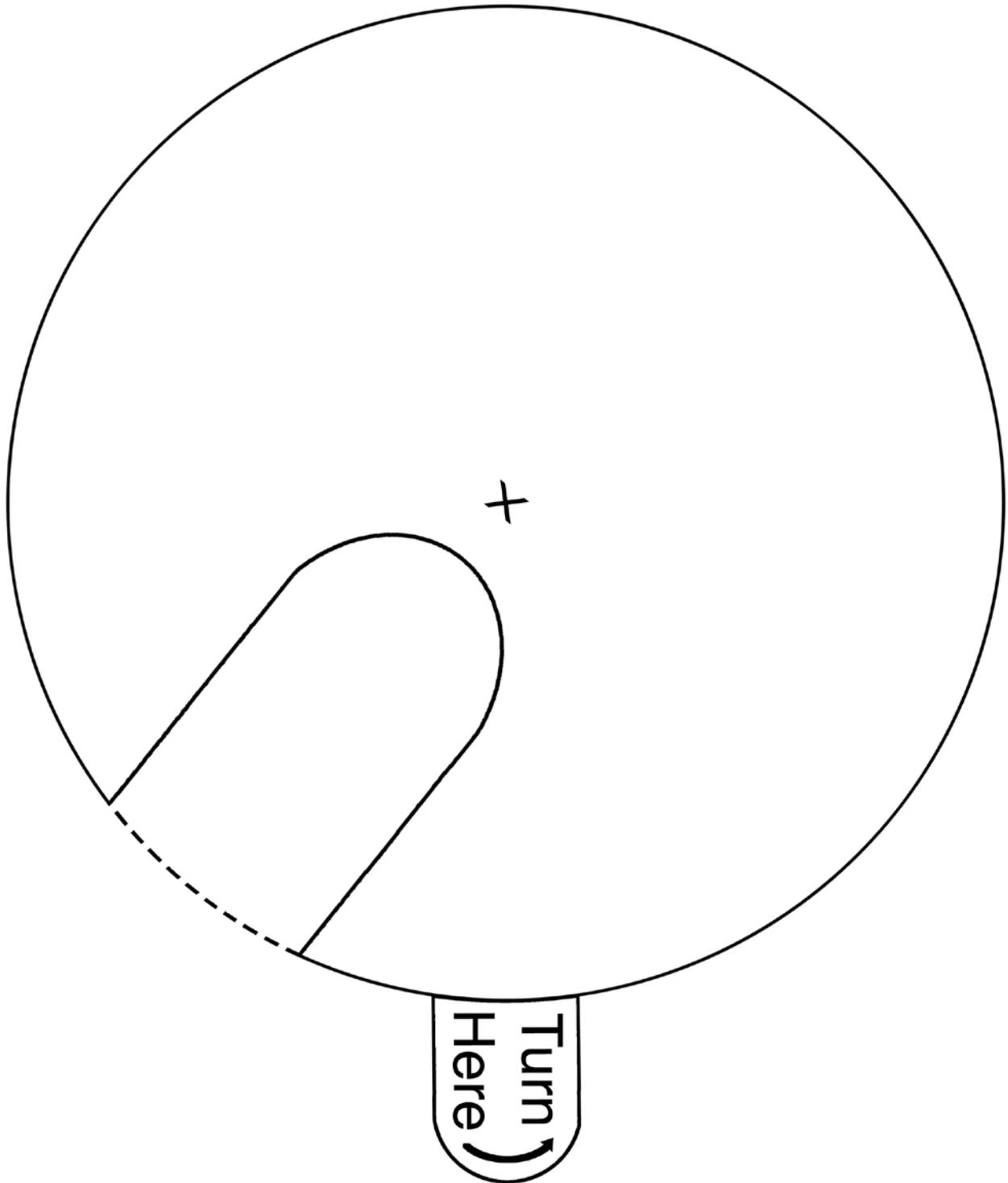
Activity Procedure:

1. Tell students that this lesson helps explain why Earth’s surface remains the same size, even though new crust is constantly being created.
2. Distribute scissors, paper fasteners, and the two Student Information Sheets: “Mollie Magma Cycle Wheel.” Show students how to make their cycle wheels by cutting out the pieces and fastening them together in the center with the paper fastener. Explain that as new ocean crust forms at mid ocean ridges, old crust is pushed down into ocean trenches, where it melts to become magma, then returns to Earth’s mantle. Ask students to note if the material at each stage is hot, cooling, or cold, the location of material at each stage, and the state of material at each stage.
3. Distribute the Student Worksheet: “The Many Stages of Mollie.” Ask students to complete the worksheet using their cycle wheels.

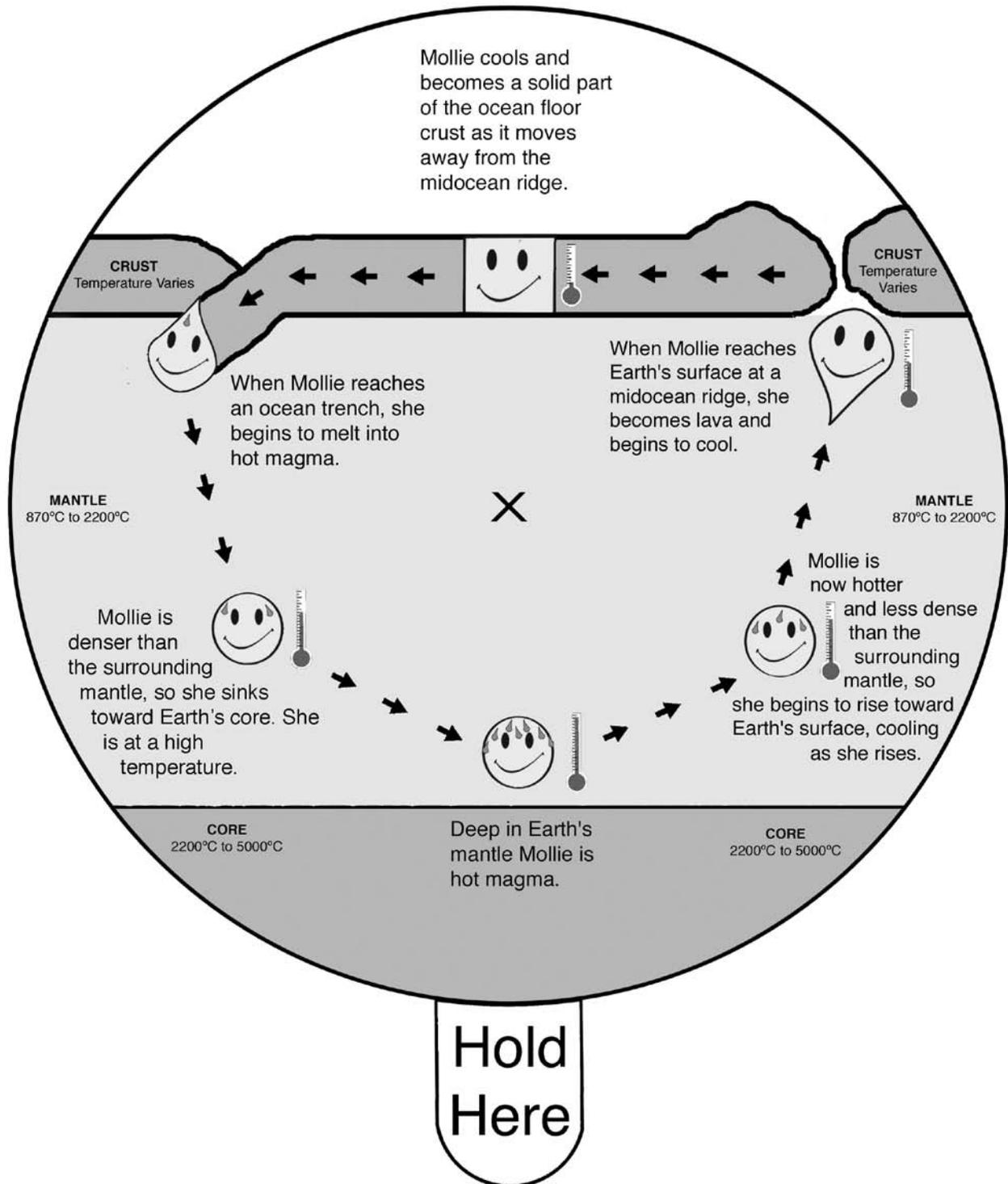
Answers to Student Worksheet:

- | | | |
|----------------------------|-----------------|------------------------------|
| 1. Temperature: d) warming | State: a) magma | Location: c) ocean trench |
| 2. Temperature: a) hot | State: a) magma | Location: b) Earth’s mantle |
| 3. Temperature: a) hot | State: a) magma | Location: b) Earth’s mantle |
| 4. Temperature: a) hot | State: a) magma | Location: b) Earth’s mantle |
| 5. Temperature: b) cooling | State: b) lava | Location: d) mid ocean ridge |
| 6. Temperature: c) cold | State: c) crust | Location: a) Earth’s surface |

Mollie Magma Cycle Wheel

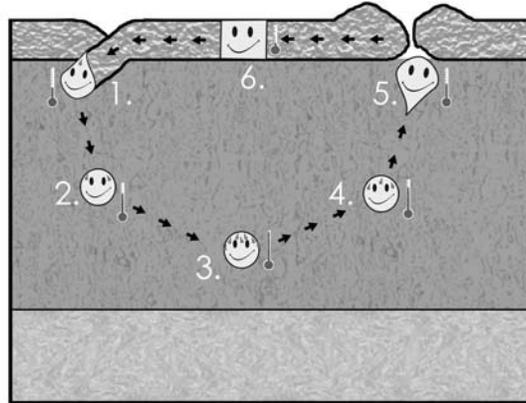


Mollie Magma Cycle Wheel



The Many Stages of Mollie

Directions: Circle the correct temperature, state and location of Mollie at each stage in the cycle.



1. Temperature: a) hot b) cooling c) cold d) warming
 State: a) magma b) lava c) crust
 Location: a) Earth's surface b) Earth's mantle c) ocean trench d) mid ocean ridge

2. Temperature: a) hot b) cooling c) cold d) warming
 State: a) magma b) lava c) crust
 Location: a) Earth's surface b) Earth's mantle c) ocean trench d) mid ocean ridge

3. Temperature: a) hot b) cooling c) cold d) warming
 State: a) magma b) lava c) crust
 Location: a) Earth's surface b) Earth's mantle c) ocean trench d) mid ocean ridge

4. Temperature: a) hot b) cooling c) cold d) warming
 State: a) magma b) lava c) crust
 Location: a) Earth's surface b) Earth's mantle c) ocean trench d) mid ocean ridge

5. Temperature: a) hot b) cooling c) cold d) warming
 State: a) magma b) lava c) crust
 Location: a) Earth's surface b) Earth's mantle c) ocean trench d) mid ocean ridge

6. Temperature: a) hot b) cooling c) cold d) warming
 State: a) magma b) lava c) crust
 Location: a) Earth's surface b) Earth's mantle c) ocean trench d) mid ocean ridge