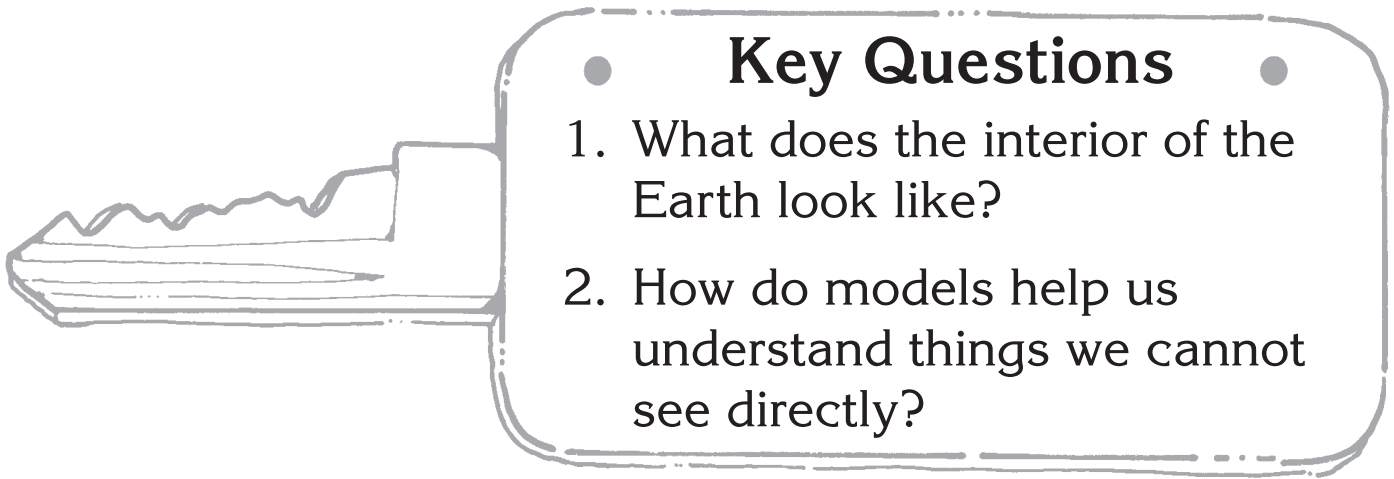


# LAYERS of the Earth



## Learning Goals

### ***Students will:***

- use a collaborative approach in solving clues to correctly construct, draw, and label the layers of the Earth; and
- construct a “slice” of the Earth that shows its interior structure.

# LAYERS of the Earth

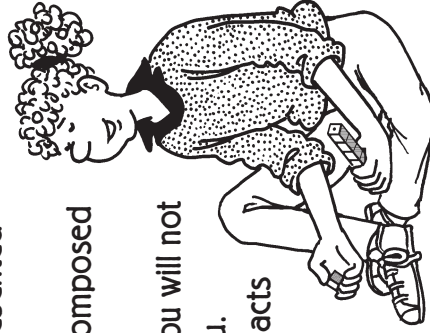
## Geologists' Clue Card One

1. Scientists theorize that there are four layers that make up the crust of the Earth.
2. The inner core is most likely a solid.
3. The layer below the lithosphere is about 2800 km thick.
4. The layer below the mantle is liquid iron and nickel.



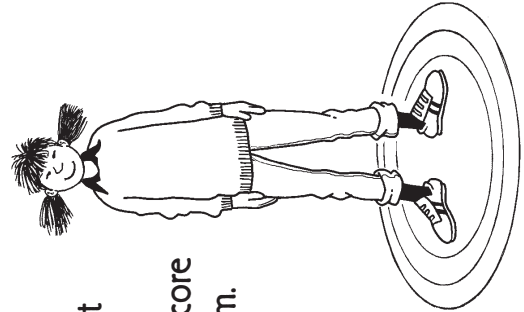
## Geologists' Clue Card Two

1. The layer above the inner core is represented by the red centicube.
2. The mantle is the thickest layer; it is composed of peridotite.
3. Each centicube represents 200 km. You will not need to use all the cubes given to you.
4. The mantle is a solid, but sometimes acts like a liquid near the portion that is directly below the lithosphere.



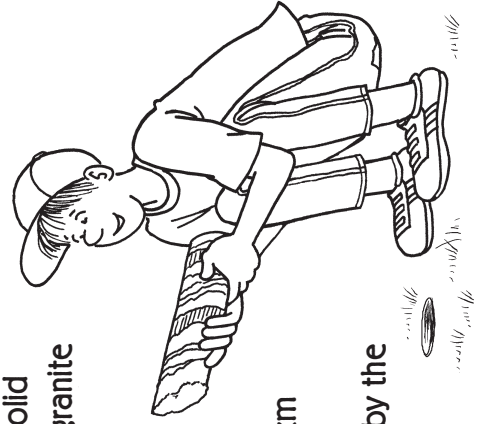
## Geologists' Clue Card Three

1. The total diameter of the Earth is about 12,800 km.
2. The radius of the inner core and outer core when added together is about 3400 km.
3. The inner core is represented by the yellow cubes.
4. The top layer is called the lithosphere.



## Geologists' Clue Card Four

1. The top layer is composed of solid rock materials that are mostly granite and basalt.
2. The inner core and outer core are both made up of the same materials.
3. The outer core is about 2200 km thick.
4. The lithosphere is represented by the brown centicube.



# LAYERS of the Earth

Draw your core sample of the Earth.  
Label each layer.



Labels to be used on  
your slice of the Earth.

**Mantle**      \_\_\_\_ km thick

**Lithosphere**      \_\_\_\_ km thick

**Inner Core**      \_\_\_\_ km thick

**Outer Core**      \_\_\_\_ km thick

**Solid**

**Solid**

**Solid**

**Liquid**

**Liquid**

**Liquid**

**Basalt**

**Granite**

**Peridotite**

**Nickel**

**Iron**

# LAYERS of the Earth

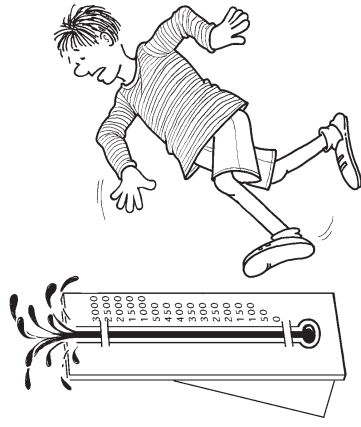
## Inner Core

The inner core consists of the elements iron and nickel. The temperature in this region reaches 5000 degrees Celsius. Under normal circumstances with these high temperatures, nickel and iron would easily melt. The inner core, however, is under such great pressure that it pushes the particles of iron and nickel together to form a solid. Scientists theorize that the iron core of the Earth may explain the existence of the magnetic fields around the Earth. The inner core has a diameter of about 2400 kilometers.



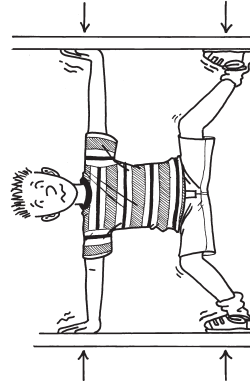
## Outer Core

The outer core consists of the elements iron and nickel. The outer core is part of a two-part core system. Scientists theorize that this region of the core is a liquid. The liquid nature of this layer is why scientists separate the core into a two-layer system. The outer core is about 2200 kilometers thick. Scientists think that this layer is probably composed of mostly nickel. The temperature of the outer core is about 3800 degrees Celsius.



## Mantle

The mantle makes up about 80% of the volume of the Earth and about 68% of the Earth's mass. It begins at a region about 200 kilometers below the surface of the Earth and extends down to 3000 kilometers. Scientists believe the mantle consists of the elements silicon, oxygen, iron, and magnesium. They theorize that the upper region of the mantle can flow like a thick liquid. The high temperature and pressure in the mantle allows the solid rock to flow slowly. Plasticity is the name given to a solid that has the ability to flow. At the top of the mantle is a region called the Moho. This area marks the boundary between the mantle and the crust.

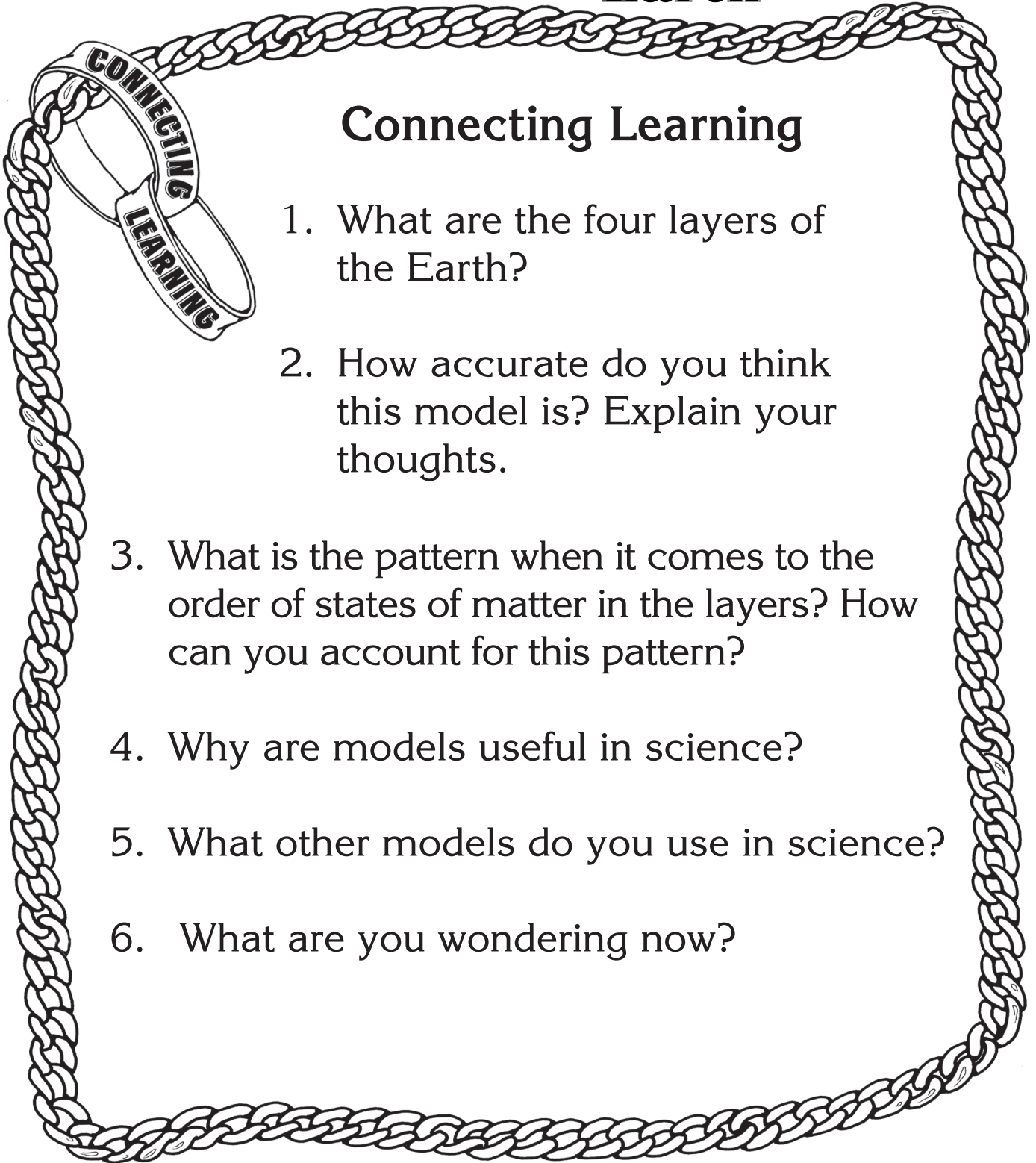


## Lithosphere

The top layer of the Earth is called the lithosphere. This layer is the thinnest of all the layers of the structure of the Earth. Most of the crust cannot be seen. It is covered with soil, rock, and minerals. The crust is made up of three different rock types: igneous rocks, sedimentary rocks, and metamorphic rocks. The thickness of the Earth's crust varies a great deal. The crust under the surface of the ocean is called oceanic crust. This is the region of the crust where it is thinnest. Oceanic crust is made up of basalt. The other type of crust, the continental crust, can be found under the continents. Continental crust is primarily composed of granite.



# LAYERS of the Earth



## Connecting Learning

1. What are the four layers of the Earth?
2. How accurate do you think this model is? Explain your thoughts.
3. What is the pattern when it comes to the order of states of matter in the layers? How can you account for this pattern?
4. Why are models useful in science?
5. What other models do you use in science?
6. What are you wondering now?