

Cross-Disciplinary

What Happens in a Kiln?

Read the following paragraph, study the table, and complete the exercises below.

After a potter makes a bowl, mug, or other such object out of wet clay on a potter's wheel, he or she must dry the object and then bake it in an extremely hot oven, called a kiln, to strengthen it. Otherwise, the clay will not hold together when the object gets wet. A similar process is used to make bricks and porcelain from clay. The temperature reached in the kiln is one factor that affects the final product, as shown in the table below.

Step	Temperature (°C)	Characteristics	Material completed
1	50–200	Remaining water evaporates from clay, but clay particles are not joined together	Dried clay
2	900–1,000	Some chemical bonds form; clay will not break down if exposed to water	Bricks
3	1,000–1,100	More chemical bonds form	Terra-cotta pottery
4	1,300–1,400	Clay is extremely hard, durable, and waterproof	Porcelain

EXERCISES

1. Suppose your school has a kiln that can fire clay at temperatures up to 1,000°C. Could you make porcelain in this kiln? Explain your answer.

2. Using the table above, explain why an object made of clay would lose its shape upon contact with water if it were not fired in a kiln.

3. Which type of clay is probably more durable, terra-cotta or porcelain? Explain your answer.
