Name: _____ Date: _____

Telling Time Before Clocks Had Hands

Circle group

You can check the time on a phone in a second. Long ago, people had to be clever.

One old tool was the sundial. It has a flat plate with marks and an upright piece that makes a shadow. As the sun moves, the shadow moves. It points to different marks during the day. But a sundial did not work at night or when clouds hid the sun.

So people made the water clock. Water dripped slowly from one pot into another. A mark on the second pot showed how much time had passed as the water rose. It did not need sunlight. It worked indoors and after dark.

Later came the hourglass. Sand ran through a narrow gap from the top bulb to the bottom one. When all the sand had fallen, a set time was over.

In Europe, builders made big clocks with gears and weights. They put them in towers of town halls and churches.

Questions

1. What makes the shadow on a sundial?

_____

_____

2. When did a sundial not work?

_____

_____

3. How did a water clock show time had passed?

_____

_____

4. What ran through the gap in an hourglass?

_____

_____

5. Why was a water clock better than a sundial indoors?

_____

_____

6. Where were the big European clocks with gears put?

_____

_____

Words to know

sundial: a tool that tells time by the shadow of the sun
shadow: a dark shape made when something blocks light
hourglass: a glass with two bulbs that lets sand run down to measure time
gears: wheels with teeth that fit together and turn

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Telling Time Before Clocks Had Hands

Triangle group

You can check the time on a phone or a watch in a second. Long ago, people had to be much more clever.

One of the oldest tools was the sundial. A sundial has a flat plate with marks on it and an upright piece that makes a shadow. As the sun moves across the sky, the shadow moves too, and it points to different marks during the day. The problem was that a sundial did not work at night or when clouds covered the sun.

So people invented the water clock. Water dripped slowly from one container into another. A mark on the second container showed how much time had passed as the water level rose. Because it did not need sunlight, a water clock could be used indoors and after dark.

Later, people made hourglasses. Sand ran through a narrow gap from the top bulb to the bottom one. When all the sand had fallen, a set amount of time was over.

Finally, in Europe, builders made big clocks with gears and weights, which were set in the towers of town halls and churches.

Questions

1. What makes the shadow on a sundial?

_____

_____

2. When did a sundial not work?

_____

_____

3. How did a water clock show that time had passed?

_____

_____

4. What moved through the narrow gap in an hourglass?

_____

_____

5. Why was a water clock more useful than a sundial indoors?

_____

_____

6. Where were the big European clocks with gears placed?

_____

_____

Words to know

sundial: a tool that tells time by the shadow of the sun
shadow: a dark shape made when something blocks light
hourglass: a glass with two bulbs that lets sand run down to measure time
gears: wheels with teeth that fit together and turn

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Telling Time Before Clocks Had Hands

Square group

Today you can check the time on a phone or a watch within a second. Many centuries ago, people had to be considerably more resourceful.

One of the oldest instruments was the sundial. A sundial consists of a flat plate covered with marks and an upright piece that casts a shadow. As the sun travels across the sky, the shadow shifts as well, pointing to different marks throughout the day. Unfortunately, a sundial was useless at night or whenever clouds concealed the sun.

Consequently, people invented the water clock. Water dripped gradually from one container into another, and a mark on the second container indicated how much time had elapsed as the water level climbed. Since it required no sunlight, a water clock could be used indoors and after dark.

Later, people created hourglasses. Sand flowed through a narrow gap from the upper bulb into the lower one, and when every grain had fallen, a fixed amount of time had passed.

Eventually, in Europe, builders constructed enormous clocks powered by gears and weights, which were installed in the towers of town halls and churches.

Questions

1. What casts the shadow on a sundial?

_____

_____

2. Under what conditions did a sundial fail to work?

_____

_____

3. How did a water clock show that time had elapsed?

_____

_____

4. What flowed through the narrow gap in an hourglass?

_____

_____

5. Why was a water clock more practical than a sundial indoors?

_____

_____

6. Where were the enormous European clocks with gears installed?

_____

_____

Words to know

sundial: a tool that tells time by the shadow of the sun
shadow: a dark shape made when something blocks light
hourglass: a glass with two bulbs that lets sand run down to measure time
gears: wheels with teeth that fit together and turn

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Telling Time Before Clocks Had Hands

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Telling Time Before Clocks Had Hands

Easier · 158 words · Flesch-Kincaid grade 2.6

1. An upright piece that blocks the sunlight.
2. At night or when clouds hid the sun.
3. The water rose on a marked pot as it dripped in.
4. Sand.
5. It did not need sunlight, so it worked inside and in the dark.
6. In the towers of town halls and churches.

Triangle: Telling Time Before Clocks Had Hands

This passage · 186 words · Flesch-Kincaid grade 5.1

1. An upright piece that blocks the sunlight.
2. At night or when clouds covered the sun.
3. The water level rose on a marked container as water dripped in.
4. Sand.
5. It did not need sunlight, so it worked inside and in the dark.
6. In the towers of town halls and churches.

Square: Telling Time Before Clocks Had Hands

Harder · 184 words · Flesch-Kincaid grade 8.9

1. An upright piece that blocks the sunlight.
2. At night or whenever clouds concealed the sun.
3. The water level rose on a marked container as water dripped in.
4. Sand.
5. It required no sunlight, so it worked inside and in the dark.
6. In the towers of town halls and churches.