Name: _____ Date: _____

# Weaving a Picture with Holes in Cards

Circle group

Weaving cloth with a picture in it used to be slow work. A loom holds many long threads side by side. They are called warp threads. To make a pattern, a weaver lifts some of the threads. Then the weaver passes a crosswise thread, called the weft, through the gap. For the next row, a different set of threads is lifted. A hard design needed hundreds of choices. One slip spoiled it. Skilled workers often needed a helper to lift the right threads in order.

In the early 1800s, a French inventor named Joseph Marie Jacquard built a part for the loom that kept the pattern on cards. Each card was stiff cardboard with holes punched in it. Each card matched one row of the design. Hooks and thin rods pressed on the card. Where there was a hole, a rod went through and lifted a warp thread. Where the card was solid, the rod was pushed back, and the thread stayed down.

The cards were tied together in a long chain. The loom moved through the cards one by one. A new chain of cards gave a new design. A pattern could be saved and used again years later, and it came out the same.

The idea mattered for more than cloth. The cards gave a machine a list of instructions. A person did not have to make each choice. Later, inventors used punched cards to feed facts into calculating machines. The cards stayed in use for decades with early computers.

## Questions

**1. What are warp threads?**

_____

_____

**2. What did each card in the chain match?**

_____

_____

**3. What happened where a card had a hole?**

_____

_____

**4. How could the same loom weave a new design?**

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**5. Why were the cards better than lifting threads by hand?**

_____

_____

**6. Why did the idea matter for more than cloth?**

_____

_____

## Words to know

loom: a machine used to weave thread into cloth
weft: the crosswise thread that goes over and under the warp
pattern: a design made of parts that are arranged in a planned way
punched: having holes made through it
instructions: directions that tell someone or something what to do

## 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: _____

# Weaving a Picture with Holes in Cards

Triangle group

Weaving cloth with a picture in it was once slow, painstaking work. A loom holds many long threads, called warp threads, stretched side by side. To make a pattern, a weaver lifts some of them, passes a crosswise thread called the weft through the gap, and then lifts a different set for the next row. A complicated design could require hundreds of separate choices, and a single slip would spoil it. Skilled workers often needed an assistant just to raise the correct threads in order.

In the early 1800s, a French inventor named Joseph Marie Jacquard built a loom attachment that stored the pattern on cards. Each card was a stiff piece of cardboard punched with holes, and each one matched a single row of the design. Hooks and thin rods pressed against the card. Where a hole appeared, a rod passed through and lifted the matching warp thread. A solid spot pushed the rod back, so the thread stayed down.

The cards were laced together into a long chain, so the loom could step through them one after another. Changing the chain changed the design. A pattern could even be saved and used again years later with exactly the same result.

The idea mattered far beyond cloth. The cards were a way to give a machine a list of instructions and let it carry them out without a person making every decision. Later inventors borrowed punched cards to feed information into calculating machines, and the cards stayed in use for decades alongside early computers.

## Questions

**1. What are warp threads?**

_____

_____

**2. What did each card in the Jacquard chain match?**

_____

_____

**3. What happened where a card had a hole?**

_____

_____

**4. How could the same loom weave a different design?**

_____

_____

**5. Why was the card chain better than a worker lifting threads by hand?**

_____

_____

**6. Why did the idea matter beyond cloth?**

_____

_____

## Words to know

loom: a machine used to weave thread into cloth
weft: the crosswise thread that goes over and under the warp
pattern: a design made of parts that are arranged in a planned way
punched: having holes made through it
instructions: directions that tell someone or something what to do

## 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: _____

# Weaving a Picture with Holes in Cards

Square group

Weaving cloth with a picture in it was once slow, painstaking, and exacting work. A loom holds many long threads, called warp threads, stretched side by side. To produce a pattern, a weaver lifts some of them, passes a crosswise thread called the weft through the opening, and then raises a different set of threads for the following row. A complicated design could require hundreds of separate choices, and a single careless slip would spoil the entire piece. Skilled workers frequently needed an assistant just to raise the correct threads in the correct sequence.

In the early 1800s, a French inventor named Joseph Marie Jacquard built a loom attachment that stored the pattern on cards. Each card was a stiff piece of cardboard punched with holes, and each one corresponded to a single row of the design. Hooks and thin rods pressed against the card. Wherever a hole appeared, a rod passed through and lifted the matching warp thread, and wherever the card was solid, the rod was pushed back, leaving the thread down.

The cards were laced together into a long chain, so the loom could step through them one after another. Changing the chain changed the design. A pattern could even be preserved and used again years later with exactly the same result.

The idea mattered far beyond the weaving of cloth. The cards offered a way to give a machine a list of instructions and let it carry them out without a person making every decision. Later inventors borrowed punched cards to feed information into calculating machines, and the cards remained in use for decades alongside the earliest computers.

## Questions

**1. What are warp threads?**

_____

_____

**2. What did each card in the Jacquard chain correspond to?**

_____

_____

**3. What happened wherever a card had a hole?**

_____

_____

**4. How could the same loom produce a different design?**

_____

_____

**5. Why was the card chain an improvement over lifting threads by hand?**

_____

_____

**6. Why did the idea matter far beyond cloth?**

_____

_____

## Words to know

loom: a machine used to weave thread into cloth
weft: the crosswise thread that goes over and under the warp
pattern: a design made of parts that are arranged in a planned way
punched: having holes made through it
instructions: directions that tell someone or something what to do

## 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: Weaving a Picture with Holes in Cards

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

### Circle: Weaving a Picture with Holes in Cards

Easier · 252 words · Flesch-Kincaid grade 3

1. The long threads that sit side by side on a loom.
2. One row of the design.
3. A rod went through and lifted a warp thread.
4. By using a new chain of cards.
5. The cards held the pattern, so no one had to make each choice, and slips could not spoil it.
6. It showed how to give a machine instructions, and calculating machines used punched cards.

### Triangle: Weaving a Picture with Holes in Cards

This passage · 255 words · Flesch-Kincaid grade 6.8

1. The long threads stretched side by side on a loom.
2. One row of the design.
3. A rod passed through, and the matching warp thread was lifted.
4. By changing the chain of cards.
5. The cards held the pattern, so no one had to make every choice and slips could not spoil it.
6. It showed how to give a machine instructions, and later calculating machines used punched cards.

### Square: Weaving a Picture with Holes in Cards

Harder · 272 words · Flesch-Kincaid grade 8.4

1. The long threads stretched side by side on a loom.
2. A single row of the design.
3. A rod passed through and lifted the matching warp thread.
4. By changing the chain of cards.
5. The cards stored the pattern, so no one had to make every choice and careless slips could not spoil it.
6. It showed how to give a machine instructions, and later calculating machines used punched cards.