**On the next several pages are two passages about people who like to invent things. Read the first passage and answer questions 10–14. Then read the second passage and answer questions 15–26 in your answer booklet.**

# Invention Number Three

by Jeanne DuPrau

Ferguson Jones was planning to be a famous inventor. He was not famous yet, being only in the fourth grade, but he was on his way. Ferguson had just completed his first invention.

"Mom," he said, "my invention is ready to be viewed. You can see it, too, Willard," he said to his brother, who was busy trying to fix the kitchen clock. "Step right into my room."

On a table in Ferguson's bedroom was a contraption made of wooden sticks, cardboard tubes, and rubber bands. A red balloon was tied to the top.

"What in the world . . . ?" said Willard.

Ferguson held up a hand. "Just watch," he said. "This invention works with chutes and levers."

Ferguson unhooked one of the rubber bands, which caused a chute to tip, which sent a ball rolling downward. The ball fell onto a lever with a tack at the other end. The tack leaped up and pierced the balloon, which popped with a loud noise.

Ferguson's mother laughed. "Very clever!" she said.

"But not very useful," said Willard. "If you want to pop a balloon, why not just stick a pin in it?"

Willard went back to the kitchen to continue his useful job of repairing the clock. He had the larger clock parts spread out on the table and the smaller parts lined up neatly on the sill of the open window.

Ferguson was sorry that his brother didn't appreciate his invention. But he wasn't discouraged. He knew that all famous inventors were scoffed at early in their careers. He got right to work on Invention Number Two.

When it was finished, he called in his mother and brother again.

"Ladies and gentlemen," said Ferguson, "I present to you Invention Number Two, which works with strings and wheels."

Invention Number Two was a network of strings that ran all the way across Ferguson's room.

"Watch this," Ferguson said, sitting down on his bed. He turned a crank, which pulled a string, which caused all the other strings to move in a complicated way. On the other side of the room, one of Ferguson's tennis shoes, hooked to the end of the string, rose into the air and traveled toward his bed. Grinning, Ferguson reached up and grabbed the sneaker.

His mother chuckled. "That's ingenious!" she said.

"Maybe so," said Willard. "But why not invent something useful?" He turned around and went back to the kitchen.

Ferguson tried to think of a useful invention. But he soon realized that what he liked best about inventing things was the invention itself—not what it was able to do. He liked figuring out what would happen if you pulled on this and pushed on that, if you tipped this one way and that the other way, if you put a weight here and a balance there. What the invention actually did wasn't nearly as interesting.

Just then Ferguson heard a startled yell from the kitchen. He dashed in to see what had happened. Willard and Mom were standing by the open window. "I just brushed it with my elbow," Willard was saying, "and it fell."

"What fell?" asked Ferguson.

"A part of the clock. It's way down there on the steps of the fire escape. I guess I could climb down and get it. . . ."

"Oh no, you could not," said Mom. "Much too dangerous."

Ferguson peered out the window. "Where is it?" he asked.

"There," said Willard, pointing. Ferguson looked closely, then saw it—a little wheel-like thing—on the edge of a step. He did some quick thinking. It wasn't straight down from the window. It was downward and outward. And there were railings in the way. Tricky, but not too tricky for a soon-to-be-famous inventor.

"OK," said Ferguson. "It's time for Invention Number Three."

It took about half an hour. Invention Number Three combined some of the finest features of Inventions One and Two.

The whole contraption lowered a magnet right onto the tiny clock part, picked it up, and swung it back through the kitchen window and into Ferguson's hand.

Ferguson handed the clock part to Willard.

"Well," said Willard, "you finally invented something useful."

Ferguson looked at his mother and smiled. She smiled back. They both knew that Invention Number Three would never have happened without Invention Number One and Invention Number Two.

**A.1.2.2**

**10.** In the passage, the word contraption means

A game.

B clock.

* C creation.

D problem.

**A.1.4.1**

**11.** What contributes to Willard's problem in the passage?

A the table

B the magnet

* C the open window

D the cardboard tables

**B.1.1.1**

**12.** Which word **best** describes the mother's attitude toward Ferguson's inventions?

A sad

B anxious

C questioning

* D encouraging

**A.1.4.1**

**13.** Which statement **best** summarizes the main idea of the passage?

A Ferguson and Willard work well together.

B Ferguson teaches Willard how to be an inventor.

C Solving problems is more difficult than inventing things.

* D Inventing things is as important as solving problems.

**A.1.2.2**

**14.** As used in the passage, what does the word ingenious mean?

* A clever

B useful

C difficult

D confusing

# Inventor at Play

by Constance Richards

According to robot-designer James McLurkin, it takes three things to become an inventor. First, you have to have the parts—the machinery, components, and tools for what you plan to create. Second, you need the knowledge—that can come from many places, such as teachers or books. But finally, and most important, you've got to have the idea.

"Having the equipment and knowledge is a good place to start," says McLurkin, "but they won't work without the idea. If you've got an idea that inspires you and drives you, then you can make things happen."

As a boy, James McLurkin had plenty of ideas, and they sometimes got him into trouble. His room was cluttered with tools, paper, glue, and half-built projects. Little experiments he tried even burnt up the bathroom. James always "was trying to build better toys than those you get in stores, which are always lamer than what you want." But his parents, who encouraged his interest in science, wanted him to quit fooling with his toys and do a better job in school.

**Learning to Be an Inventor**

One day James's parents gave him a collection of Legos. He called it "the key to life." For the first time, he could take an idea from his head and translate it into a real object of his own design. He built elaborate mini-airplanes, futuristic automobiles, and spaceships. But while the projects were fun, he knew they didn't do much. What James wanted to make was something that really had a use.

In sixth grade, James discovered computers and soon wrote his own video game after reading a book on programming. He also loved riding his BMX bike but thought the single-speed bike was too slow.

Inspired by his dad's tinkering in the garage, James got out some tools and set about adding two gears to make the bike faster. People told him it couldn't be done, but he soon had the fastest bike on the block. Then he wanted to know how fast his geared-up bike could go. So he learned a bit about voltage and electric current with his cousin's help and built a digital speedometer. "When I fell off at 35 miles per hour, I got a serious case of 'road rash,'" he remembers.

By 15, playing with his "toys" had taught James about computer programming, electronics, and how to design and build simple machines. Now, James could finally take that knowledge and fulfill his dream of building an invention from scratch that actually did something—he would build a robot.

**Rover and Robot Ants**

A robot is a real challenge because it requires electrical and mechanical parts to work together with computer software. But with parts collected from previous projects, and a computer processor James built himself, his first robot, Rover, was born.

By the time James got to college at the Massachusetts Institute of Technology in Boston, he had built two more robots. Now he had a whole lab of equipment and computers to experiment with. He wanted to build more robots, but rather than big ones, he became fascinated by the idea of building small robots that could work together—like ants. If thousands of individual ants can work together as a community, James wondered, why couldn't tiny robots be programmed to do the same thing?

Eventually James designed a robot the size of a walnut that could fit in the palm of his hand. He is still working to improve his robot ants. "They will have to be much more intelligent to be useful," James explains. An army of ant robots could eventually be helpful in jobs such as helping police gather information from places too dangerous for humans. They could even pitch in to do household chores. "Any job where one robot is useful, more are better," James says.

And playing with "toys" may just help you, like James, learn and dream enough to invent something big!

**A.2.6.1**

**15.** The author's purpose is to give

* A information about an inventor.

B a description of different machines.

C instructions for creating new things.

D a warning about a dangerous invention.

**A.2.2.2**

**16.** Read the sentence from the passage.

"For the first time, he could take an idea from his head and translate it into a real object of his own design."

What does the word translate mean?

A take something apart and rebuild it

B think about something for a long time

C make something that is not very useful

* D take something and turn it into something else

**A.2.3.1**

**17.** What is the main reason James wanted to build small robots?

A to teach others to have big dreams

* B to build something that is useful

C to improve someone else's idea

D to learn to be the best inventor

**A.2.2.2**

**18.** Read this sentence from the passage.

"Inspired by his dad's tinkering in the garage, James got out some tools and set about adding two gears to make the bike faster."

What does the word inspired mean?

A to be directed

* B to be given an idea

C to have forgotten a step

D to have worked together

**B.3.1.1**

**19.** Which sentence from the passage is an opinion?

A "Then he wanted to know how fast his geared-up bike could go."

* B "'Any job where one robot is useful, more are better,' James says."

C "Eventually James designed a robot the size of a walnut that could fit in the palm of his hand."

D "When I fell off at 35 miles per hour, I got a serious case of 'road rash,' he remembers."

**A.2.3.1**

**20.** Read this sentence from the passage.

"And playing with 'toys' may just help you, like James, learn and dream enough to invent something big!"

Which **best** explains the meaning of this sentence?

A You need to enjoy having fun while you are young.

B Playing with toys can help you do a better job in school.

C It is important to try to become an inventor.

* D Playing is one way to use your imagination.

**A.2.3.1**

**21.** Based on the passage, what would James McLurkin most likely encourage kids to do?

A take a class in computer programming

B follow directions to build small robots

C be careful to avoid making mistakes

* D find fun ways to be creative

**Questions 22–26 relate to BOTH passages.**

**B.1.2.1**

**22.** How are Ferguson's Invention Number Three and James's Rover alike?

A Both were made of cardboard tubes.

B Both were school projects.

* C Both were built from previous projects.

D Both were toys each boy improved.

**B.1.2.1**

**23.** Both Ferguson and James would most likely agree that it is important to have

A supportive siblings.

B good grades.

C deadlines.

* D dreams.

**B.1.2.1**

**24.** How do Ferguson's and James's thoughts about inventing differ?

* A James prefers inventions that are practical.

B James prefers inventions that are large.

C Ferguson prefers inventions that are useful.

D Ferguson prefers inventions that are electronic.

**B.1.2.1**

**25.** What did **both** Ferguson and James receive from their parents?

A toys that taught them computer skills

* B support for their creativity

C a whole lab of science equipment

D encouragement to do better in school

**B.1.2.1**

**26.** What word or phrase could describe **both** Ferguson and James? Use at least one example from **each** passage to support your response.