Directions
Read this passage. Then answer questions XX through XX.

What Are Wind Tunnels?

by David Hitt

1. Wind tunnels are large tubes with air moving inside. The tunnels are used to copy the actions of an object in flight. Researchers use wind tunnels to learn more about how an aircraft will fly. NASA uses wind tunnels to test scale models of aircraft and spacecraft. Some wind tunnels are big enough to hold full-size versions of vehicles. The wind tunnel moves air around an object, making it seem like the object is really flying.

How do Wind Tunnels Work?

2. Most of the time, powerful fans move air through the tube. The object to be tested is fastened in the tunnel so that it will not move. The object can be a small model of a vehicle. It can be just a piece of a vehicle. It can be a full-size aircraft or spacecraft. It can even be a common object like a tennis ball. The air moving around the still object shows what would happen if the object were moving through the air. How the air moves can be studied in different ways. Smoke or dye can be placed in the air and can be seen as it moves. Threads can be attached to the object to show how the air is moving. Special instruments are often used to measure the force of the air on the object.

How Does NASA Use Wind Tunnels for Aircraft?

3. NASA has more wind tunnels than any other group. The agency uses the wind tunnels in a lot of ways. One of the main ways NASA uses wind tunnels is to learn more about airplanes and how things move through the air. One of NASA’s jobs is to improve air transportation. Wind tunnels help NASA test ideas for ways to make aircraft better and safer. Engineers can test new materials or shapes for airplane parts. Then, before flying a new airplane, NASA will test it in a wind tunnel to make sure it will fly as it should.

4. NASA also works with others that need to use wind tunnels. That way, companies that are building new airplanes can test how the planes will fly. By letting these companies use the wind tunnels, NASA helps to make air travel safer.
How Can Wind Tunnels Help Spacecraft?

NASA also uses wind tunnels to test spacecraft and rockets. These vehicles are made to operate in space. Space has no atmosphere. Spacecraft and rockets have to travel through the atmosphere to get to space. Vehicles that take humans into space also must come back through the atmosphere to Earth.

Wind tunnels have been important in making the Ares rockets and Orion spacecraft. Ares and Orion are vehicles that will take astronauts into space. NASA engineers tested ideas for the design of Ares in wind tunnels. They needed to see how well Ares would fly. Engineers tested Orion models. They needed to know what would happen to different designs when the spacecraft came back through the atmosphere.

Long after the first design work is finished, NASA can still use wind tunnels. Wind tunnel tests have helped NASA change the space shuttle to make it safer. Wind tunnels will keep helping make all spacecraft and rockets better.

Wind tunnels can even help engineers design spacecraft to work on other worlds. Mars has a thin atmosphere. It is important to know what the Martian atmosphere will do to vehicles that are landing there. Spacecraft designs and parachutes are tested in wind tunnels set up to be like the Martian atmosphere.

NASA has many different types of wind tunnels. They are located at NASA centers all around the country. The wind tunnels come in a lot of sizes. Some are only a few inches square, and some are large enough to test a full-size airplane. Some wind tunnels test aircraft at very slow speeds. But some wind tunnels are made to test at hypersonic speeds. That is more than 4,000 miles per hour!

1. Which of the following best summarizes the main idea of the passage?

   A  “Researchers use wind tunnels to learn more about how an aircraft will fly.”
      (paragraph 1)

   B  “Special instruments are often used to measure the force of the air on the object.”
      (paragraph 2)

   C  “NASA engineers tested ideas for the design of Ares in wind tunnels.”
      (paragraph 6)

   D  “Long after the first design work is finished, NASA can still use wind tunnels.”
      (paragraph 7)
2. Which key detail helps the reader understand the importance of using wind tunnels?
   
   A  Wind tunnels can move air more than 4,000 miles per hour.
   B  Wind tunnels are design tools that help make safer aircraft vehicles.
   C  Wind tunnels can create different atmospheres.
   D  Wind tunnels are large tubes that show how air moves.

3. The statement that “NASA also works with others that need to use wind tunnels” most strongly suggests that
   
   A  many different groups are developing space shuttles
   B  NASA hopes to buy vehicles made by other agencies
   C  NASA has the largest wind tunnels in existence
   D  many companies do not have their own wind tunnels

4. The most important feature of a wind tunnel used to test vehicles that can land on Mars is the ability to test how
   
   A  gravity affects vehicles
   B  a thin atmosphere affects vehicles
   C  high-speed winds affect vehicles
   D  freezing temperatures affect vehicles

5. Which sentence from the passage best explains why NASA uses wind tunnels to test spacecraft models?
   
   A  “These vehicles are made to operate in space.” (paragraph 5)
   B  “Spacecraft and rockets have to travel through the atmosphere to get to space.” (paragraph 5)
   C  “They needed to know what would happen to different designs when the spacecraft came back through the atmosphere.” (paragraph 6)
   D  “Some are only a few inches square, and some are large enough to test a full-size airplane.” (paragraph 9)
Which sentence from the passage best explains how a wind tunnel works?

A  “NASA uses wind tunnels to test scale models of aircraft and spacecraft.” (paragraph 1)
B  “The object to be tested is fastened in the tunnel so that it will not move.” (paragraph 2)
C  “The air moving around the still object shows what would happen if the object were moving through the air.” (paragraph 2)
D  “Smoke or dye can be placed in the air and can be seen as it moves.” (paragraph 2)
The Discontented Rock

an Iroquois tale by Frances Jenkins Olcott

1. FROM the beginning of the Earth, Gustahote, the great Rock, had overhung the valley. He watched and guarded the land, but he was not content, and longed to be something mightier and stronger than he was.

2. "If I could be the wide river that flows through the valley," he thought, "then surely I should be mighty and strong! The river winds happy and free through its broad lands; and green grass and flowers follow its course. If I could only be that river!"

3. And instantly Gustahote the Rock became the river. Down the valley he sped, leaping with joy, and the singing brooks from the hills ran into his stream. Through rocky gorges he tossed his foaming waves toward the Sky, and they returned to him in a rainbow spray. He wound around the bases of lofty mountains, and leaped down precipices. Then through the silent forest he glided, and the trees dipped their branches in his cool waters.

4. On and on he hastened, faster and faster, growing wider as he went, until at last he plunged into the billowing ocean. It encircled him with its broad, hungry arms, and drew him down and mingled his waters with the deep, so that he was the river no longer.

5. Then suddenly Gustahote found himself again the Rock, overhanging and guarding the valley. And he rejoiced to have escaped from the hungry deep.

6. But he was not content. He still longed to be something mightier and stronger than he was.

7. "If I could have wings, and live in the Sky," he thought, "then surely I should be mighty and strong! The Sky is open and pathless, and leads to unseen heights. It has no billowing deep to swallow the unfortunate."

8. And even as he thought thus, Gustahote the Rock became a bird, and the air was caressing and delicious as he tried his wings. He plumed them, and fluttered them, and spreading them wide, soared into the Sky. Beneath him were the valleys and the forests and the mountains, growing smaller and smaller as he flew upward.

9. The air became cold, as he rose above the clouds and entered the Land of Mists. A whirling wind rushed past him, breaking his wings. They drooped at his sides, and he fell heavily toward the Earth. But a fiercer blast caught him, and tore his body to fragments, and whirled the pieces over and over through the endless grey Sky.
Then suddenly Gustahote found himself again the Rock, overhanging and guarding the valley. And he rejoiced that he had escaped from the pathless Sky.

But still he was not content. He longed to be something mightier and stronger than he was.

"If I could be a creature, and wander about on the Earth," thought he, "then surely I should be mighty and strong. Fair are the valleys of the Earth, and wide its green forests, and beautiful and fruitful its meadows. It has no fierce rushing wind to rend in pieces the unfortunate."

And even as he thought thus, Gustahote the Rock became a creature walking upon the Earth. He wandered up and down the world, so strange to him, and soon grew lonely and desired a companion.

First he sought the beasts, but they were too busy getting their food to stop and talk to a strange creature. After that he went to the birds, but they were nesting, and could not stop to talk to a strange creature. Weary, lonely, and despairing, he wandered about.

Then suddenly Gustahote found himself again the Rock overhanging and guarding the valley. And he rejoiced that he was a Rock once more. And he heard a voice whisper:—

"Be content, O Gustahote the Rock! The waters may overflow you, but they cannot drown you. The Sun may look upon you with its hottest rays, but he cannot burn you. The tempest may strike you, but it cannot rend you. Old age cannot wrinkle you. The rivers may dry up in their beds, the forests may fall into dust, but you will stand stanch and true, and always watching, and forever remain unchanged and changeless."

So Gustahote the Rock rejoiced exceedingly; and he still overhangs and guards the valley. The river flows from him, and the Sky smiles or frowns, and the Earth heeds him not. But he is content.
7. What makes Gustahote lonely while he's an Earth creature? Use two details or examples from the passage to support why Gustahote is lonely.
SEVERAL very large families of Fireflies lived in the marsh and were much admired by their friends who were awake at night. The older Fireflies told the younger ones that they should get all the sleep they could during the daytime if they were to flutter and frisk all night. Most of them did this, but two young Fireflies, who cared more about seeing the world than they did about minding their elders, used to run away while the rest were dreaming. Each thought herself very important, and was sure that if the others missed her they wouldn't sleep a wink all day.

One night they planned to go by daylight to the farthest corner of the marsh. They went to bed when the rest did and pretended to fall asleep. When she was sure that the older Fireflies were dreaming, one of them reached over with her right hind leg and touched the other just below the edge of her left wing-cover. “Are you ready?” she whispered.

“Yes,” answered the friend, who happened to be the smaller of the two.

When well away from their sleeping relatives, they lifted their wing-covers, spread their wings, and flew.

“Oh, wouldn't they make a fuss if they knew!” exclaimed the Larger Firefly.

“They think we need to be told every single thing,” said the Smaller Firefly.

Just then a Flycatcher darted toward them and they had to hide. He had come so near that they could look down his throat as he flew along with his beak open. The Fireflies were so scared that their feelers shook.

“I wish that bird would mind his own business,” grumbled the Larger Firefly.

“That's just what he was doing,” said a voice beside them, as a Garter Snake drew himself through the grass. Then their feelers shook again, for they knew that snakes do not breakfast on grass and berries.

“Did you ever see such luck?” said the Smaller Firefly. “If it isn't birds it is snakes.”

“Perfectly dreadful!” answered the other. “I never knew the marsh to be so full of horrid people.”

Then they reached the farther corner of the marsh and crawled around to see what they could find. Their eyes bothered them so that they could not see unless they were
close to things, so it was useless to fly. They peeped into the cool dark corners under the skunk cabbage leaves, and lay down to rest on a bed of soft moss.

13 While they were resting, they noticed a plant growing near. It had a flower of green and dark red which was unlike any other blossom they had ever seen. Each leaf was stiff and hollow and grew right out of the ground instead of coming from a stalk.

14 “I'm going to crawl into one of them,” said the Larger Firefly. She balanced herself on the top of a fresh green leaf.

15 “I'm going into this one,” said the other Firefly, as she alighted on the edge of a brown-tipped leaf. “It looks nice and dark inside.” Each dropped quickly into her own leaf.

16 Then there was a queer sputtering, choking voice in the fresh green leaf and exactly the same in the brown-tipped one. After that a weak little voice in the green leaf said, “I fell into water.”

17 Another weak voice from the brown-tipped one replied, “So did I.”

18 On the inside of each leaf were many stiff hairs, all pointing downward. Now that they wanted to get out, these same hairs stuck into their eyes and pushed against their legs and made them exceedingly uncomfortable.

19 After a while they gave up trying to get out until they should be rested. It was after sunset when they tried the last time, and the light that shone from their bellies brightened the little green rooms where they were. They went at it carefully. Slowly, one foot at a time, they managed to climb out of the doorway at the top. As they came out, they heard the squeaky voice of a young Mouse say, “Oh, where did those bright things come from?”

20 They also heard his mother answer, “Those are only a couple of foolish Fireflies who have been in the leaves of the pitcher-plant all day.”

21 They flew toward home. “I'm dreadfully tired,” said one, “but I suppose we shall have to dance in the air with the rest or they will make a fuss.”

22 “Yes,” said the other. “It spoils everything if we are not there.”

23 As they came near the middle of the marsh they were surprised to see the mild summer air twinkling with hundreds of tiny lights as their friends and relatives flew to and fro in the dusk. “Well,” said the Larger Firefly, “I think they might have waited for us!”

24 “Humph!” said the Smaller Firefly. “If they can't be more polite than that, I won't play.”

25 So two very tired and cross young Fireflies sat on a last year’s cat-tail and sulked. “We were not even missed!” they cried.

26 They were much wiser after that, for they had learned that two young Fireflies were not so wonderfully important after all. And that if they chose to do things which it was never meant young Fireflies should do, they would be likely to have a very disagreeable time, but that other Fireflies would go on eating and dancing and living their own lives. To be happy, they must keep the Firefly laws.
8. Explain why the young fireflies complain about the older fireflies. Use two details from the passage to support your answer.
In the beginning of each passage, both Gustahote and the Fireflies believe something about themselves that is not true. Write a response comparing and contrasting what the characters believe at the beginning of the passages. Explain when the lessons are learned and how the characters have changed. Use details from both passages to support your answer.

In your response, be sure to:
- compare and contrast what the characters believe at the beginning of passages
- explain when the lessons are learned
- describe how the characters change
- use details from both passages to support your answer

Check your writing for correct spelling, grammar, capitalization, and punctuation.