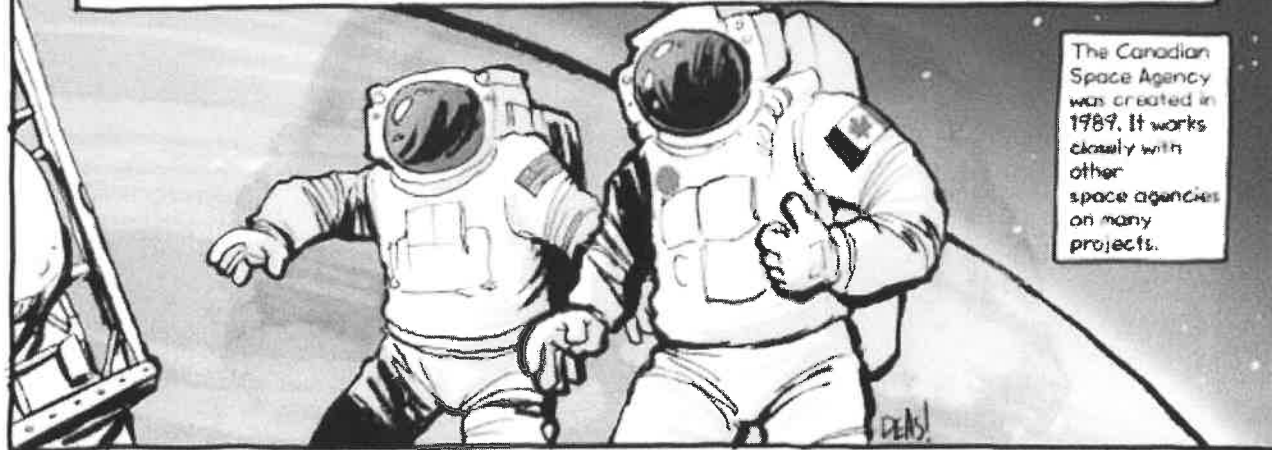
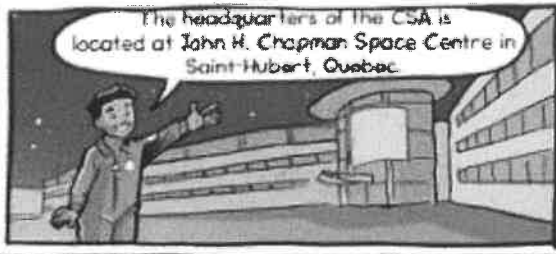


DID YOU KNOW?

The Canadian Space Agency



Comprehension Check

Mark the statements **T** (True) or **F** (False). If a statement is *true*, write one fact to support it on the lines below. If a statement is *false*, write the word or words that make it true on the lines below.

_____ 1. **What does CSA stand for?**

- a) Canada's Solar Advent.
- b) Canada Space Association.
- c) Canadian Space Agency.
- d) None of the above.

_____ 2. **Where is the CSA headquarters located?**

- a) In Ontario.
- b) In Chapman.
- c) In Quebec.
- d) None of the above.

_____ 3. **What does the CSA aim to do?**

- a) Ensure that Canadians benefit from space research.
- b) Contribute to space exploration.
- c) Both a and b.
- d) None of the above.

_____ 4. **How many times has the CSA hired new astronauts?**

- a) Once.
- b) Twice.
- c) Three times.
- d) None of the above.

_____ 5. **In all, how many astronauts are or have been part of the CSA?**

- a) Six.
- b) Nine.
- c) Fourteen.
- d) None of the above.

Look closely at the comic. What are some products and services that space research has made possible? Which of these have you benefited from?

Our Newbie Astronauts: Ready to Lift Off!



Want to be an astronaut? Think you have what it takes? When the Canadian Space Agency (CSA) put out a call for applicants, 3772 people applied. They underwent a year of gruelling tests. Just two were chosen for the job.

Congratulations Joshua Kutryk and Jennifer Sidey-Gibbons!

Choosing “the best of the best”

All applicants needed to have at least one university degree (most had two or more). Their degrees were in science, engineering, or medicine. They had to be physically fit and in excellent health.

They were put through rigorous tests. These tests assessed their thinking skills and logic. Their ability to quickly learn new skills. Their character. Judgment. Motivation. Teamwork. Communication skills.

The applicants were thrown into pretend emergency scenarios. Could they think and react under pressure? How resilient

were they? Did they show good leadership skills?

The thousands of applicants were reduced to 72. Then to 32. Then to 17.

Then to two.

From farm boy to fighter pilot

Joshua Kutryk grew up on a farm in eastern Alberta. As a kid he was fascinated by space.

At age nine he went for a ride in a small plane.

“When we landed I knew that I wanted to fly.” He also wanted to understand “the science and engineering that made flying possible.”

He earned several university degrees. He became a test pilot with the Canadian Armed Forces.

“It combined two of my favourite things: engineering and high-performance flying.”

His dad used to tell him to always try new things. He thinks that's good advice.

"I have learned to embrace new, unknown experiences and not to fear them."

Teacher and inspiration

Jennifer Sidey-Gibbons grew up in Calgary. She, too, likes to figure out how things work. She also loves a challenge.

She has several degrees in mechanical engineering. She became a researcher at one of the world's top universities. She was also an instructor.

"My favourite part was the interaction I had with students."

As an astronaut, she'll continue inspiring young people to pursue their interests in science.

The best advice she ever received? Don't sweat the small stuff.

"There will be setbacks and difficult times. Stay focussed on a long-term goal. Make sure you don't get discouraged."

Off to NASA

All new CSA recruits complete two years of basic astronaut training. They learn everything they need to know to blast off and work in space. They do this training with American astronauts from NASA. They've just graduated.

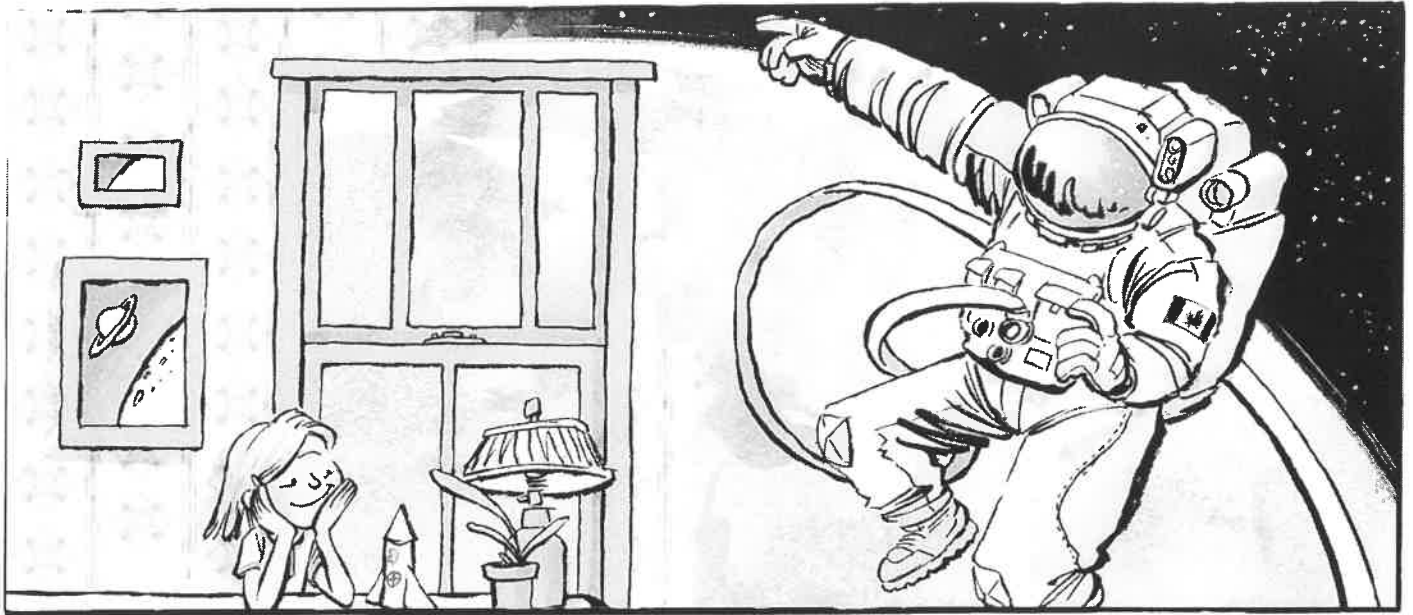
"Jenni is outrageously smart," said one NASA classmate. "She's outrageously fun to be around. And she's just going to be a fantastic crewmate."

As for Mr. Kutryk? Great technical skills, said his classmates. But one said his

special talent was making crewmates feel empowered and listened to.

"I think I trust him with my life."

As you see it, which adjectives best describe Jennifer Sidey-Gibbons and Joshua Kutryk?



Comprehension Check

Mark the statements **T** (True) or **F** (False). If a statement is *true*, write one fact to support it on the line below. If a statement is *false*, write the word or words that make it true on the line below.

____ 1. Astronauts must have at least three university degrees.

____ 2. Astronauts must be resilient and have good leadership skills.

____ 3. Basic astronaut training takes one year.

____ 4. Jennifer Sidey-Gibbons and Joshua Kutryk are from Alberta.

____ 5. Jennifer Sidey-Gibbons has a degree in medicine.

____ 6. Joshua Kutryk was a teacher before becoming an astronaut.

Language Focus

A **contraction** is a shortened form of a word or phrase. Most contractions are formed by replacing some letters with an apostrophe.

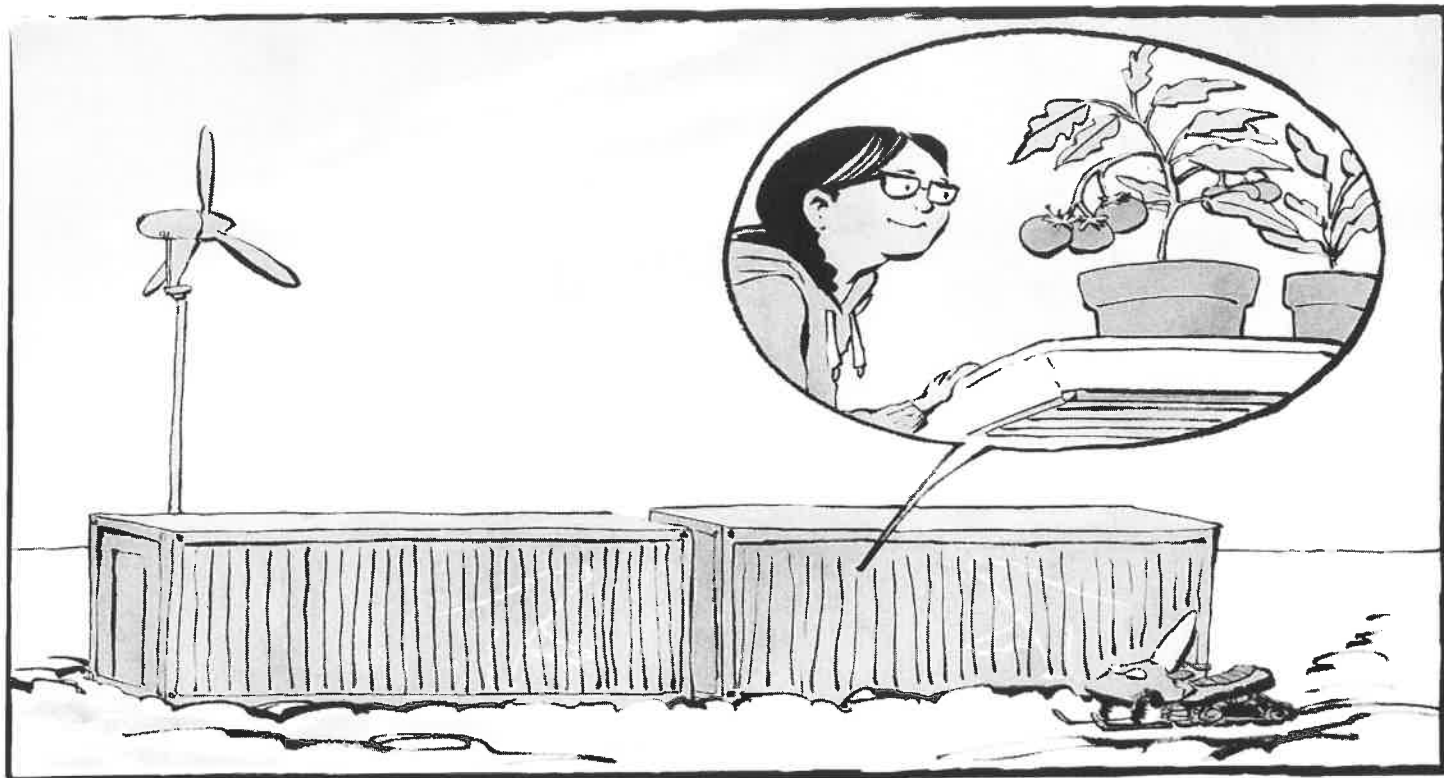
Example: **should not – shouldn't**

Can you make contractions for the word combinations below?

1. it is
2. was not
3. will not
4. should not
5. is not
6. let us
7. he is
8. could not
9. we have
10. can not

Challenge: How many contractions can you find in the article?

Growing a Garden Where???



Let's head for Gjoa Haven. It's a community in Nunavut.

It's way north, far above the Arctic Circle. Imagine a treeless landscape of rock and tundra. That is probably not where you expect to find a garden growing fresh lettuce and tomatoes.

Welcome to Naurvik

The garden is inside two shipping containers. Even during the cold, dark, Arctic winter, there's light and warmth inside the containers. Solar panels and windmills provide most of the power.

Crops are grown hydroponically. That means they don't need soil. Instead they grow in a solution of water and nutrients.

The garden is called Naurvik. That means "growing place" in Inuinnaqtun – the Inuit language of the region.

Northern food

Naurvik is a research project. Its purpose is to learn how to grow food in remote and harsh environments. Places like Gjoa Haven, for example. Or even on the moon or Mars. That's why the Canadian Space Agency is one of the project partners.

Government scientists are supporting this project. Local people helped to design and run it. This is a team effort.

"It's this really neat, magic thing that's happening," says the project leader.

The people of Gjoa Haven have traditionally hunted for food. They've harvested plants and berries. They've never been farmers. So why have they welcomed this greenhouse project?

Food is very expensive in the North. Most of it has to be flown in. By the time it reaches the local store, it's not fresh.

If northern communities could grow some of their own food, it would cost less. Also, people would eat healthier.

First crop

“I never grew plants before in my life,” says Betty Kogvik. She is one of five technicians working in the greenhouse. She helped grow the first crop of lettuce – in the dead of winter.

“It was so crisp. Really fresh and tasty,” she says. Not at all like the old, tired lettuce in the grocery store.

The lettuce was delivered to local elders. They were delighted. “One elderly lady even danced with joy when she got her lettuce.”

What’s next?

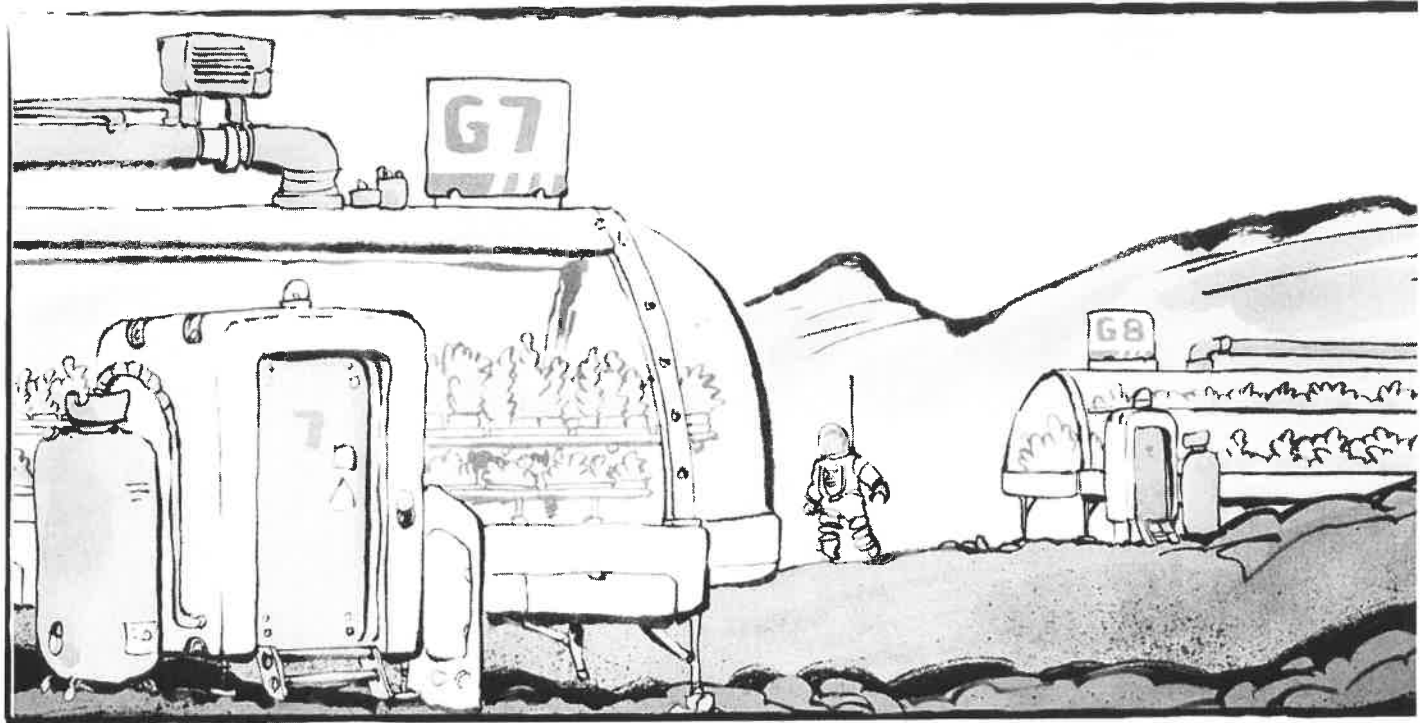
Next up for the garden – a crop of cherry tomatoes. After that, it depends what community elders decide. Some like the idea of blueberries and cloudberries. Others suggest plants used for traditional teas and medicines.

If it is a success, the project could be expanded. It’s easy to get more shipping crates. The project could also spread to other northern communities. Gjoa Haven would help with the training.

“When I first heard of [the project], I thought it would never work up here,” says one Gjoa Haven elder. “Not in this 40 below zero [climate].”

“Now I know anything is possible.”

Would *you* be interested in growing a garden? Explain.



Comprehension Check

Answer the questions below in complete sentences:

- 1.** Describe Arctic winters.
- 2.** How have the people of Gjoa Haven traditionally accessed food?
- 3.** Where is the Naurvik garden located?
- 4.** How do crops grow hydroponically?
- 5.** List suggestions given by the Gjoa Haven community for future crops to grow in the Naurvik garden.

Language Focus

Homographs are words that are spelled the same but have different meanings. (They may or may not be pronounced the same.)

Example: bow = a knot tied with loops / to bend over

Directions: Choose five homographs from the list below. For each one, write two sentences to show two possible meanings:

present	tear	bat	bass	lead	project
desert	object	fine	wind	minute	back

Example: He tied a **bow** in his shoe / The actors each took a **bow**.

1. a)

b)

2. a)

b)

3. a)

b)

4. a)

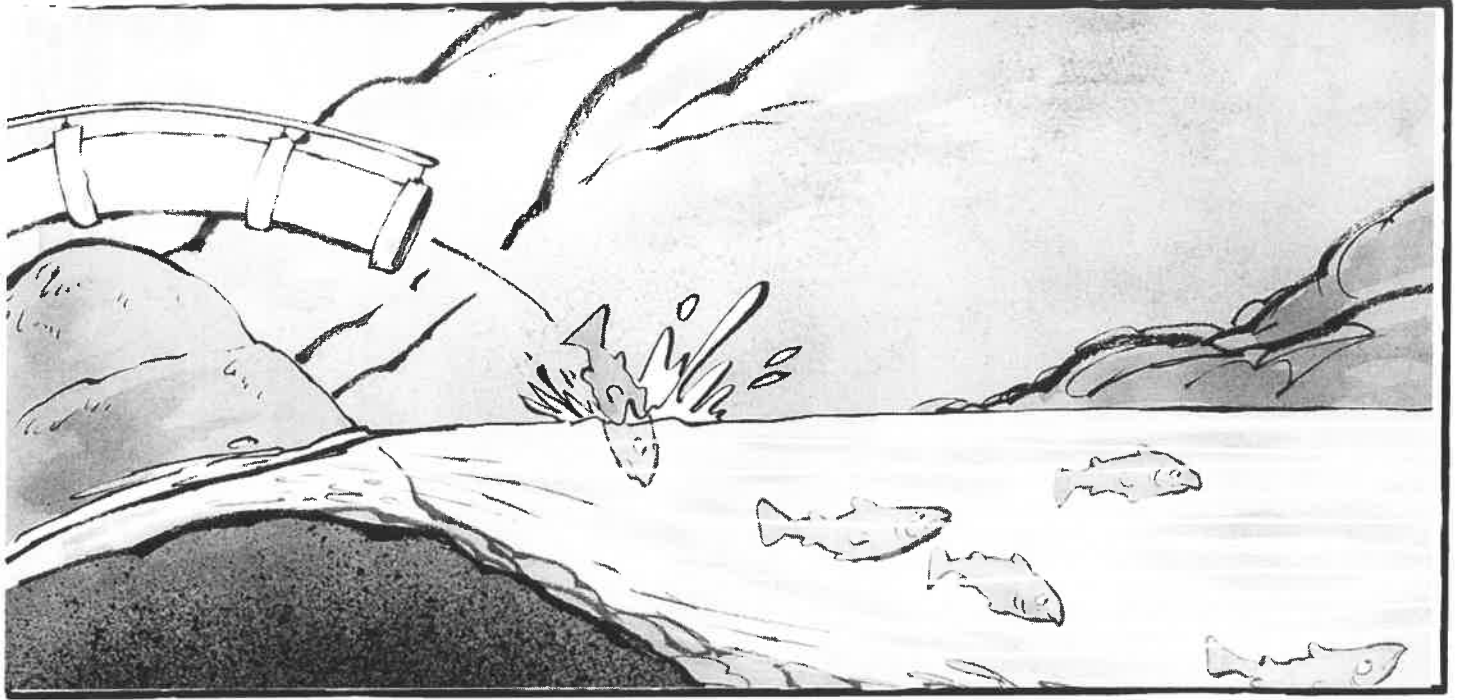
b)

5. a)

b)

What examples of homographs can you find in the article?

A Salmon Cannon



The salmon are swimming upstream. Battling against the current. Struggling through the rapids. They're migrating from the ocean near Vancouver up the mighty Fraser River. They're headed there to spawn. But then... they run into a Big Problem.

The circle of life

The Fraser River is a major salmon highway. Millions of salmon migrate upstream each summer and fall.

The fish return to the **tributary** streams where they were born. They spawn in the gravel. The eggs hatch and the young fish make their way downstream. After spending time at sea, the next generation of salmon returns to spawn. It's a cycle that has been repeating itself for thousands of years.

No go

Then, in late 2018, disaster struck. One stretch of the Fraser flows through a narrow canyon. That's where huge pieces of rock broke off

from a 125-metre cliff. They crashed into the river, narrowing the channel. They also formed a five-metre high waterfall. This created a big obstacle for the fish.

The rock slide was on the traditional territory of the Secwepemc Nation. It was on a remote stretch of the river where there were no roads. So fisheries officials didn't find out about it until June 2019.

That's when alarm bells rang. Even before the rock slide, many Fraser River salmon runs were in trouble. Now they faced the possibility of extinction.

To the rescue!

Government fisheries workers joined forces with local First Nations.

They tried to make the channel easier for the fish to get through. They placed big boulders in the current. This created pools of quieter water behind the rocks where fish could rest.

They also scooped up more than 60,000 salmon from below the blockage. They were lifted by helicopter past the obstruction. Unfortunately many of those fish did not survive the trip to the spawning grounds. All in all, 2019 was a terrible year for the Fraser River salmon runs.

Was there another way to help the fish?

Whoosh!

This summer the salmon are in for the surprise of their lives!

Just before they reach the rock slide, they will encounter a ‘fish ladder.’ Five hundred concrete blocks have been placed in the river to form steps. Fish can use this ladder to reach a holding pond just below the rock slide.

Then, they’ll get a boost from a ‘salmon cannon.’ Workers feed the salmon into long rubber hoses. Water is pumped through the hoses to ‘whoosh’ the fish up 160 metres. Once above the rock barrier, the fish are whooshed back into the river.

“We want to see the fish passage completely restored,” says a fisheries worker. But in the meantime, he says, these salmon need a friendly boost.

Did you know? Some Fraser River salmon swim over 1600 kilometres upstream to reach their spawning grounds.

A *tributary* stream is a stream flowing into a larger river or lake.

What is the importance of helping spawning salmon?
Explain.



Comprehension Check

Write the letter of the best answer in the space beside each question.

_____ **1. Where do salmon spawn?**

- a) In the ocean.
- b) Anywhere they want.
- c) Where they hatched.
- d) On Vancouver highways.

_____ **2. When do salmon migrate to spawn?**

- a) From summer through fall.
- b) From winter through spring.
- c) From fall through winter.
- d) In winter only.

_____ **3. Where is the Fraser River?**

- a) Alberta.
- b) British Columbia.
- c) Manitoba.
- d) Nunavut.

_____ **4. When did a rock slide block part of the Fraser River?**

- a) 2017.
- b) 2018.
- c) 2019.
- d) 2020.

_____ **5. What is a salmon cannon?**

- a) Nets hanging from a helicopter to lift salmon over obstacles.
- b) Concrete blocks that form steps in the river.
- c) Long rubber hoses that whoosh fish over obstacles.
- d) A large piece of artillery used in salmon warfare.

Language Focus

A **compound word** is formed when two words are joined to form a new word.

Example: space + suit = spacesuit

Which word from the group of three can be combined with the word on the left to make a compound word?

Write this new word in the blank.

1. moon + (beam, star, orbit) = _____

2. milk + (cream, drink, shake) = _____

3. key + (turn, board, player) = _____

4. sand + (stone, gravel, toys) = _____

5. sea + (fish, snack, shore) = _____

Now go back and reread the article. List all the compound words that you find: