Canada Science and Technology Museum

Museum mission

Museum mission answer key

Ages 12 Plus

Ingenium

CANADA SCIENCE AND TECHNOLOGY MUSEUM
MUSÉE DES SCIENCES ET DE LA TECHNOLOGIE DU CANADA

Canada

Into the great outdoors

Enjoying winter

1. How do snowshoes stop you from sinking deep in the snow?
   Snowshoes distribute a person's weight across a wide surface, allowing them to walk on snow without sinking.

2. On display, you will see Huron snowshoes, Ojibwe snowshoes, Yukon snowshoes, Bear Paw snowshoes and modified Bear Paw snowshoes. Why are their shapes different from each other?
   Different types of snowshoes have different uses: hiking across fields and light forests or deep snow in open terrain etc.

Freedom on two wheels

3. Name three elements which improved the bike:
   A chain and gears which send power to the back wheel; an elongated diamond-shaped frame which lowers the rider's centre of gravity; air-filled tires for a smoother ride; and brakes.

Pathways to adventure

4. What was the cost of a convertible car in the late 1940s?
   $4000

5. How long did it take Rosemary and her friends to drive from Vancouver to Ottawa along the Trans-Canada Highway?
   37 days

6. What distance did they travel?

   12 391 km

7. In which decade did people start using planes to get to the outdoors?

   1920s

Steam: a world in motion

8. Name the four locomotives on display:

- **CN6400**
- **CP3100**
- **CP2858**
- **CP926**

9. What kind of engine do they use?

   Steam

10. How many kilometres of track were built across Canada between 1907 and 1956?

    96 287km

11. How many immigrants came to Canada between 1900 and 1950?

    More than 5 million

12. Almost all of them arrived using the power of:

    Steam

Sound by design

Seeing sound

13. Which controversial invention lead to the invention of the telephone?

    The ear phonautograph

14. Who invented it?

    Alexander Graham Bell and Clarence J. Blake

Making silence

15. Go to the Quiet Cube. Do you hear an echo?

    An anechoic chamber is built to eliminate echo and noise.

16. What is used to get rid of echoes in an anechoic chamber?

    Acoustic wedges are made of sound-absorbing materials and their triangular shape traps and breaks up sound waves.

Design icons

17. The Grammy award was named after what?

    The tabletop gramophone

Electronic instruments

18. We can play it without ever touching it. What is this instrument?

    The Theremin

From earth to us

Material	Is it recyclable?	What percentage can be recycled?
Metal	Yes	100%
Composites	No	0%
Polymers	Yes	80%
Ceramics	Yes	100%
Plastic toys	No	0%
Smartphone	Yes	~100%
Steel	Yes	90%
Smart car	Yes	90%
Toaster	Yes	100%

Changing climate, changing world

19. What is global warming?

    It is the long-term trend of rising average global temperature.

20. What is climate change?

    It is the rising temperature, plus the changing precipitation, wind, storms, and more that result from it.

21. How do scientists learn about past climates?

    Cave rocks, ice, oceans, and trees all hold a record of past climates – spanning hundreds or even thousands of year.

Mining: Why we really dig earth!

22. Which raw materials do we mine to make the following?

Glass	→	sand
Plastic	→	oil
Structures	→	metals

Energy: How do we power our lives?

23. Which home appliances use the most energy?

Tablet	or	TV
Washer	or	Dryer
Heater	or	Portable fan

24. Which one uses the most energy of all?

    Dryer

25. What percentage of global hydroelectricity is produced in Canada?

    12%

Medical sensations

Touch

26. How are 3D printers used in medicine?

    Doctors are using 3D models to plan and practise complicated heart, brain, and reconstructive surgeries. Educators also use 3D printing to teach about parts of human anatomy that students can't access in real life.

27. What were two uses of the Clay Anatomical Model?

    By removing organs from a model, medical students can learn anatomy without the mess. The museum's model belonged to a Toronto doctor who used it to explain ailments to patients who didn't speak English.

Smell and taste

28. A doctor's first clues about an illness often come from the smell of the patient's body. Associate the following smells to the disease:

a. Butcher shop	i. Diabetes Nail	→	Polish remover
b. Fish	ii. Typhoid	→	Fresh baked bread
c. Freshly-baked bread	iii. Liver failure	→	Fish
d. Nail polish remover	iv. Yellow Fever	→	Butcher shop

29. At what angle is the slope of the Crazy Kitchen?

    12 degrees

Out of the shadows

30. What three words does the sphere of letters in the *Out of the Shadows* artifact spell?

    Surprise, Perception, Illusion

Hidden worlds

31. Name three Ininew constellations:

    The Seven Birds; The Dog Stars; Bear; Fisher

32. Name three Ojibwe constellations:
    Wintermaker; Moose; Fisher

33. Name three D(L)akota constellations:
    Turtle; Thunderbird; Salamander

Beyond earth

34. What is the difference between a reflecting and a refracting telescope?
    A reflecting telescope collects and reflects light using mirrors and a refracting telescope bends light using lenses.

Magnificent magnifiers

35. A simple microscope with a single lens can magnify up to 200 times. What about a compound microscope?
    2000 times

36. What about an electron microscope?
    10 million times

Wearable tech

Pet projects

37. What information does the SeeHorse Biometric Monitor tell you about your horse?
    The SeeHorse monitors your horse's temperature, heart rate, respiration, activity levels and movement and sends this data to your mobile device
38. Dogs have different characteristics that allow them to do things humans cannot.
    Rescue gear has been created for them to wear to help them do the following: rappel

into collapsed buildings, navigate dangerous terrain, and stay in constant contact with their handlers.

Suit yourself

39. Find the unique apparel created by Inuit women. What is it called?

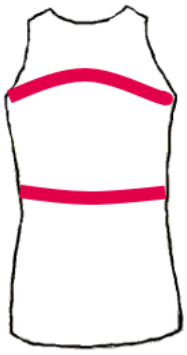
    Amauti

Get connected

40. What is the purpose of the Hexoskin, the biometric suit?

    The sensors in this biometric clothing have helped revolutionize athletic training. The Hexoskin collects data from your body to track your training in real time which allows you to measure your performance and develop new training routines for improved results.

41. Draw the location of the breathing sensors within the Hexoskin on the diagram.



42. What is the name of the Canadian Olympic champion wrestler from Ottawa who trained with this Hexoskin?

    Erica Wiebe

Body shop

43. A regular heartbeat is essential for ensuring the body gets the oxygen and nutrients it needs. How does a pacemaker keep the heart beating in rhythm?
    The pacemaker sends jolts of electricity to the heart to keep it beating in rhythm.

Technology in our lives

Consumer culture

44. What was the number of women in the paid labour force during wartime?
    During the Second World War, a quarter-million Canadian women joined the paid-labour force.

45. How old were you when Kijiji was launched?
    Kajiji was launched in 2005.

46. What was the main contributor of Canada's population growth in 1999?
    Immigration

47. Name a household item that was once considered a luxury but is now a necessity. Do you agree?
    The dishwasher.

The weight of our stuff

48. In the work by artist HA Schult, what do the "trash people" represent?
    The Trash People represent us and our consumer culture.

This lesson plan was produced by the Canada Science and Technology Museum.

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