Super Structures
Fiona Undrill

Read and discover all about super structures around the world ...
- What are dams made of?
- How tall can a skyscraper be?

Read and discover more about the world! This series of non-fiction readers provides interesting and educational content, with activities and project work.

Series Editor: Hazel Geatches

Audio CD Pack available

Word count for this reader: 1,200

Level 3
600 headwords

Level 4
750 headwords

Level 5
900 headwords

Level 6
1,050 headwords

Cover photograph: Corbis (Canary Wharf/Construction Photography)
A structure is something made with many parts, like a house, a school, or a bridge. It can be made of different materials like bricks, concrete, glass, wood, or metal. A super structure is very big, very long, or very tall.

What structures can you see here? How many parts can you see? What are the structures made of? What other structures can you think of?

Now read and discover more about super structures!
Tunnels go underwater, underground, or through the ground. We use tunnels for mines, trains, and road traffic, or to carry things like gas or water. Tunnels are usually made of metal and concrete.

One of the longest tunnels in the world is the Seikan Tunnel in Japan. It’s nearly 54 kilometers long! It goes between two islands. It was built because it’s too dangerous to travel by boat. The tunnel is for trains, but now many people prefer to travel by plane.

One of the longest road tunnels is the Laerdal Tunnel in Norway. The tunnel is nearly 25 kilometers long and it goes through a mountain. It was built because there’s too much snow on the mountain roads in winter.

In the tunnel there are three big caves where drivers can stop and rest.
Bridges go over water or overground.

On a beam bridge, the pillars carry the deck. One of the longest beam bridges is the Lake Pontchartrain Causeway in the USA. This bridge is about 38 kilometers long and it has over 9,000 concrete pillars. It goes over water and carries road traffic.

On a suspension bridge, the cables and towers carry the deck. The anchorages hold the cables.

Suspension bridges move a little when it’s windy. This isn’t usually a problem, but in 1940 the Tacoma Bridge in the USA collapsed in light winds. It was only four months old.
When there isn’t much ground, we can build tall buildings. Very tall buildings are called skyscrapers. The first skyscraper was the Home Insurance Building. It was built in Chicago in the USA in 1885. It was 42 meters tall. The tallest skyscrapers are now much taller than this.

The Petronas Twin Towers in Kuala Lumpur in Malaysia are the tallest twin buildings. There is a bridge between the two towers called a skybridge.

One of the tallest skyscrapers is the Burj Dubai*'. It’s in Dubai in the United Arab Emirates. It’s 818 meters tall – that’s nearly a kilometer! It’s made of a special, strong concrete called reinforced concrete. The Burj Dubai has apartments, shops, swimming pools, hotels, restaurants, and a library. It’s like a very tall town! Do you like it?

The concrete in the Burj Dubai weighs the same as about 100,000 elephants!

*Now called Burj Khalifa
Some of the biggest structures are dams. They hold back water and make a lake called a reservoir. Dams supply water, stop floods, and they also make electricity.

Gravity dams are made of a lot of concrete. They are very big and heavy, and this weight holds back the water. The Itaipu Dam is a gravity dam. It’s in South America between Paraguay and Brazil. It’s 196 meters tall and nearly 8 kilometers long.

Arch dams are also made of concrete. They are usually smaller than gravity dams and they are curved. The curve holds back the water. The Moiry Dam in Switzerland is an arch dam. It’s 148 meters tall and 610 meters long.

The first dam was built more than 4,000 years ago in Egypt. It never worked because it fell down in heavy rain.
There are many super structures in Beijing in China. Some of them were built for the Olympics in 2008.

Terminal 3 of Beijing Capital International Airport is one of the biggest airport terminals in the world. The floor area is more than a square kilometer. There are seven floors, and two of the floors are underground.

The Beijing National Stadium is one of the biggest metal buildings. It’s red and gold. It has 80,000 seats. There were 11,000 extra seats for the Olympics. It also has underground pipes to make it warm in winter and cool in summer.

Sometimes it’s called the Bird’s Nest – can you see why?

Red and gold are traditional colors for Chinese buildings. Red is the Chinese color for good luck.

Go to pages 32–33 for activities.
Different Shapes

With new building materials, people can build structures in many different shapes.

The O2, in London in the United Kingdom, is a dome. It was built for the millennium, the year 2000. The roof is made of a special plastic and glass material. It’s 365 meters wide – one meter for every day of the year. It has also 12 support towers – one tower for every month of the year.

In 2008, David Fisher designed the first rotating skyscraper. It uses energy from the wind. People want to build these rotating skyscrapers in Dubai and in Moscow.
In a village in Sweden, near the Arctic, there is a hotel made of ice called Ice Hotel. The hotel is open from December to April. It has 80 rooms. There are ice sculptures in the rooms. The beds, chairs, and tables are also made of ice. Even the drinking glasses are made of ice!

Most buildings are made of concrete, bricks, metal, or wood. Some buildings use different materials.

Biosphere 2 in Arizona in the USA is made of glass and metal. It’s nearly as big as two and a half American football fields. Inside, there’s a rainforest, an ocean, a desert, a farm, and places for people to live and work. It’s a research center.
Did you know that people also build structures under the ocean and on ice?

The Poseidon Undersea Resort in Fiji is a hotel 12 meters under the ocean. It’s made of very strong metal and plastic. The windows are made of special, clear plastic, so people can see fish and other ocean animals from the hotel. To get to the hotel, you travel by submarine!

Halley 6 is a research station in the Antarctic. It’s built on ice. The ice moves 400 meters every year and the structure moves with it. Halley 6 is on skis so people can move it back to the right place. Building in the Antarctic is very difficult because of the very, very cold weather.

In the Antarctic, the wind speed can be 150 kilometers per hour. The temperature can be less than –50 degrees centigrade.
There are also structures in space. The International Space Station (ISS) is a research station. It's about 350 kilometers above Earth. It goes around Earth about 16 times every day. It travels at 27,700 kilometers per hour — that’s nearly 8 kilometers per second!

The ISS is made of metal. It uses energy from the sun. The first part of the ISS went into space in a rocket in 1998. No astronauts went with it. Most other parts went with astronauts. Sometimes, astronauts do a spacewalk outside the ISS to attach new parts.
Animals can build super structures, too!

Termites build their homes with mud. These homes are tall towers called termite mounds. The tallest termite mounds are about 13 meters high. They are termite skyscrapers!

Wombats build underground tunnels called burrows. They dig with their front paws and bite through things with their teeth. A wombat can dig about 2 meters per hour.

Beavers build dams on the water to protect themselves from other wild animals like bears. They build the dams with small trees, stones, and mud. Their dams can be a kilometer long.

Termites are insects. The tallest termite mounds are thousands of termites tall!
1 Match.

1. It was built because there's too much snow on the mountain roads in winter.
2. It was built because it's too dangerous to travel by boat.
3. It's for road traffic.
4. It's for trains.

2 Write true or false.

1. Tunnels can carry water. **true**
2. The Seikan Tunnel is longer than the Laerdal Tunnel. **false**
3. The Laerdal Tunnel is shorter than the Seikan Tunnel. **true**
4. The Seikan Tunnel goes through water. **false**
5. It's quicker to use the Seikan Tunnel than to travel by plane.

3 Circle the correct words.

1. Tunnels go **under** / over water or ground.
2. Tunnels are made of metal and glass / concrete.
3. The Seikan Tunnel is in China / Japan.
4. The Laerdal Tunnel is in Spain / Norway.

4 Complete the sentences.

1. Tunnels are usually made of **metal** and concrete.
2. The Seikan Tunnel is one of the __________ tunnels.
3. The Laerdal Tunnel is nearly ______________ long.
4. The Seikan Tunnel goes ________ the water.
5. The Laerdal Tunnel goes ________ a mountain.

5 Write A or B.

1. Which is the longest tunnel? **A**
2. Which tunnel goes underground? __________
3. Which tunnel is for trains? __________
4. Which is the shortest tunnel? __________
5. Which tunnel goes underwater? __________
6. Which tunnel is for cars? __________
Bridges

Circle the correct words.
1. Bridges go underground / overground.
2. The longest / shortest beam bridge is in the USA.
3. Beam bridges and suspension bridges both have a tower / deck.
4. The Tacoma Bridge is a beam / suspension bridge.

Write the words.
cable deck pillar deck anchorage tower suspension bridge beam bridge

Find and write the words.

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Answer the questions.
1. What carries the deck on a beam bridge?
   The pillars carry the deck.
2. What carries the deck on a suspension bridge?
3. What is a problem for suspension bridges?
4. Which bridge collapsed when it was windy?
5. Write about a bridge in your country.

beam bridge

1
2
3
4
5
6
7
8
3 Skyscrapers

Read pages 8–9.

1 Match.

1 Sears Tower
2 Petronas Twin Towers
3 Taipei 101
4 Shanghai World Financial Center
5 Burj Dubai

2 Write the numbers.

10mm 900m 1,000m 92cm 100cm 8mm

1 about a centimeter 8mm
2 about a meter ______
3 about a kilometer ______
4 the same as a centimeter ______
5 the same as a meter ______
6 the same as a kilometer ______

3 Complete the sentences.

1 The Taipei 101 is shorter than the Sears Tower. (short / shorter / shortest)
2 The Shanghai Financial Center is _______ than the Petronas Twin Towers. (tall / taller / tallest)
3 The Burj Dubai is the _______ skyscraper. (tall / taller / tallest)
4 The Sears Tower is _______ than the Taipei 101. (tall / taller / tallest)
5 The Sears Tower is _______ than the Burj Dubai. (short / shorter / shortest)

4 Answer the questions.

1 Where was the world’s first skyscraper built?

__________________________

2 How tall is the Burj Dubai?

__________________________

3 What are the tallest twin buildings called?

__________________________

4 What is your favorite skyscraper? Why?

__________________________

__________________________
**Dams**

Read pages 10–11.

1. **Write the words.**
   - reservoir
curve
arch dam
concrete
gravity dam
reservoir

2. **Write true or false.**
   1. Dams make water.  
      - False
   2. A reservoir is like a lake.  
      - True
   3. Dams supply food.  
      - False
   4. Dams stop floods.  
      - True
   5. The Itaipu Dam is taller than the Moiry Dam.  
      - True

3. **Complete the puzzle.**

4. **Answer the questions.**

   1. What type of dam is the Itaipu Dam?
      - Gravity dam

   2. Where is the Moiry Dam?
      - Switzerland

   3. With an arch dam, what holds back the water?
      - Arch

   4. With a gravity dam, what holds back the water?
      - Gravity

   5. Write about a dam in your country.
Olympic Structures

1 Match.
1. It's made of metal.
2. The floor area is more than a square kilometer.
3. It has 80,000 seats.
4. Sometimes it's called the Bird's Nest.
5. It's one of the biggest airport terminals.

2 Circle the correct words.
1. Terminal 3, Beijing Capital International Airport:
   - It's in Russia / China / the USA.
   - It's for cars / trains / planes.
2. The Beijing National Stadium:
   - It's like a bird's nest / school.
   - It's made of metal / wood / glass.
   - It has underground pillars / pipes / seats.

3 Complete the sentences.
   super metal airport terminals Olympics color
   1. Red is the Chinese _______ for good luck.
   2. Many buildings were built for the _______ in 2008.
   3. Beijing has many _______ structures.
   4. Terminal 3 of the Beijing Capital International Airport is one of the biggest _______ _______.
   5. The Beijing National Stadium is one of the biggest _______ buildings.

4 Answer the questions.
1. When were the Beijing Olympics?
2. Beijing is the capital of what country?
3. What is the Chinese color for good luck?
4. What is the Beijing National Stadium made of?
5. Write about a sports stadium in your country.
6 Different Shapes

1 Circle the correct words.
The O2:
1 It was built for the Olympics / millennium.
2 There are 365 months / days in a year.
3 There are 12 months / days in a year.
The rotating skyscraper:
4 It can rotate a full square / circle.
5 It uses energy from the sun / wind.
6 It can be a different floor / shape every day.

2 Write the months.
September June November February April July January December August May March October

3 Complete the sentences.
materials skyscraper dome London day shapes

1 With new building __________, people can build structures in different __________.
2 The O2 is in __________. It’s a __________.
3 The rotating __________ can change shape every __________.

4 Match. Then write sentences.
The O2
There are 12 months
Every floor can rotate
There are 365 days
The rotating skyscraper uses

1 The O2 is a dome.
2
3
4
5
1 Write the words.
   bricks  glass  ice  wood
   concrete  metal

2 Write true or false.
   1 Ice Hotel is open in January. _____
   2 Ice Hotel is not open in March. _____
   3 Biosphere 2 is a small town. _____
   4 Biosphere 2 is made of glass and wood. _____
   5 There is an ocean in Biosphere 2. _____
   6 There is an ice hotel in Biosphere 2. _____

3 Match.
1 It’s made of glass and metal.
2 It’s made of ice.
3 It’s in Sweden.
4 It’s in the USA.
5 It’s a research center.
6 I want to go there.

4 Order the words.
1 Ice / Hotel / made / is / ice / of
   Ice Hotel is made of ice.
2 again / year / Hotel / is / Every / Ice / built
3 open / It / from / is / April / December / to
4 drinking / glasses / ice / The / made / of / are
5 glass / made / Biosphere 2 / of / is / metal / and
6 a / is / rainforest / There / in / Biosphere 2.
3 Complete the sentences.

weather under on plastic moves

1. The Poseidon Undersea Resort is ______ the ocean.
2. The windows are made of a special ______.
3. Halley 6 is built ______ ice.
4. The ice ______ 400 meters every year.
5. Building in the Antarctic is very difficult because of the ______.

4 Answer the questions.

1. Where is the Poseidon Undersea Resort?
   ________________________________________________________________

2. Where is Halley 6?
   ________________________________________________________________

3. How do you get to the Poseidon Undersea Resort?
   ________________________________________________________________

4. How cold can it be in the Antarctic?
   ________________________________________________________________

5. What is your favorite structure? Why?
   ________________________________________________________________
Read pages 20-21.

1. **Find and write the words.**

   - astronaut
   - frsrtibps
   - aofevrstp
   - ecushhsta
   - awkesdaco
   - reoawtce
   - ttoriikkc
   - hexcnbocd
   - bdshlttle

   **Write the words.**

   1. ____________
   2. ____________
   3. ____________
   4. ____________
   5. ____________
   6. ____________

2. **Write the numbers.**

   27,700  8  1998  350  16

   1. The ISS is _______ kilometers above Earth.
   2. It goes around Earth about _______ times every day.
   3. It travels at _______ kilometers per hour.
   4. It travels at _______ kilometers per second.
   5. The first part of the ISS went into space in _______.

3. **Write the words.**

   - Earth
   - astronaut
   - ISS

   **Answer the questions.**

   1. Where is the ISS?
   2. What is the ISS?
   3. When did the first part of the ISS go into space?
   4. How many astronauts went into space with the first part of the ISS?
   5. Where do astronauts do spacewalks?
   6. Can you see the ISS from Earth?
1 Write true or false.
1 Termites build their homes with concrete. ________
2 Wombats build burrows underground. ________
3 Wombats bite through things with their teeth. ________
4 Beavers build dams under the water. ________
5 Beaver dams can be a kilometer long. ________
6 There is a termite mound in my home. ________

2 Order the words.
1 too. / Animals / build / can / structures / super
   ____________________________
2 mounds / Termite / skyscrapers. / are / termite
   ____________________________
3 Wombats / about / meters / dig / hour. / per / 2
   ____________________________
4 build / Termites / with / their / mud. / homes
   ____________________________
5 dams / Beaver / be / long. / a / can / kilometer
   ____________________________

3 Complete the puzzle.
1 It's the name of this book.
2 Very tall buildings are called ___.
3 An arch dam has a ___.
4 A tunnel goes here.
5 Beam and suspension are types of ___.
6 It's a strong building material.
7 Laerdal and Seikan are ___.
8 In Norway, there is a ___ through a mountain.
9 The Beijing National Stadium is made of ___.
10 It holds back water.
11 Bridges go ___ water.
12 The Pontchartrain Causeway is very ___.
13 Biosphere 2 is made of metal and ___.
### Super Structures in My Country

1. Complete the chart about super structures in your country.

<table>
<thead>
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<th>What's it called?</th>
<th>What type of structure is it?</th>
<th>How big is it?</th>
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2. Make a poster. Use pictures and write about the super structures.

3. Display your poster.

---

### Design a Super Structure

1. Think of a super structure.

2. Write notes and complete the diagram.

   - Materials:
   - Type:
   - Name of structure:
   - Shape and size:
   - Where:

3. Draw your super structure. Write sentences to describe it.

4. Display your design.
Picture Dictionary

- bite
- bricks
- bridge
- concrete
- dam

- nest
- ocean
- paw
- pipe
- plastic

- desert
- dig
- drinking glass
- electricity
- flood

- rainforest
- road
- roof
- seat
- shapes

- glass
- ground
- ice
- island
- lake

- skyscraper
- space
- square kilometer
- stone
- submarine

- metal
- million
- mine
- mountain
- mud

- telescope
- temperature
- traffic
- tunnel
- wood
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<th>The World of Arts &amp; Social Studies</th>
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For younger students, Dolphin Readers Levels Starter, 1, and 2 are available.