

# Buildings and Measurements



## Discussion:

What is the tallest building or place you've ever climbed?  
Fill out the table then discuss with your partner or group.

Name?	
Where?	
When?	
What could you see?	
How tall is the building?	

For a bonus point: Can you name the 3 buildings pictured above?

## Measurements

Match the correct word to the correct number

Weight

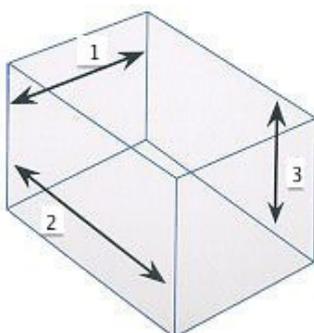
Height

Metres

Width

Length

Celsius



Usain Bolt runs the 100 4

In Qatar, summer temperatures reach 50 5

The 6 of the Statue of Liberty is 204116kg

## GRAMMAR CHECK: Adjective vs. Noun

### In English, we say:

The Eiffel tower is 324 metres high.

and

The height of the Eiffel Tower is 324 metres.

(Both sentences are correct)

**High = Adjective**    and    **Height = Noun**

**Wide = Adjective**    and    **Width = Noun**

**Long = Adjective**    and    **Length = Noun**

### Rule to make a sentence:

• **Thing** + **Measurement** + **Adjective**

• **Noun** + **Thing** + **Measurement**

### Example:

The Great Wall of China is 8,851km long.

The length of the Great Wall of China is 8,851km.

### “Respectively”

We often use the word “respectively” in English to talk about more than one measurement of an object. Think about the Golden Gate Bridge in San Francisco, USA:



Height: 227m

Width: 27m

Length: 2,737m

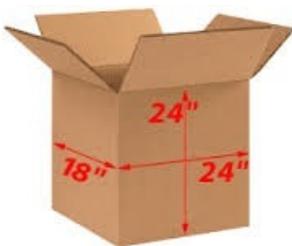
### It is true to say:

The height of the Golden Gate Bridge is 227m. The width of the Golden Gate Bridge is 27m and the length of the Golden Gate bridge is 2,737m.

But the sentence is long and repetitive. it's better to say:

The **height**, **width** and **length** of the Golden Gate Bridge are **227m**, **27m** and **2,737m** respectively.

**Exercise:** How would you describe the measurements of the box below? Use the word “respectively.”



**Measurement Quiz** - Answer the questions below

- 1) Which piece of sports equipment is 274cm long, 153cm wide and 3cm high?
- 2) What is the distance (in km) from London to New York?
- 3) Which South American landmark measures 30 metre high and 28 metres wide?
- 4) Which object weighs  $5.9736 \times 10^{24}$  and has a circumference of 40,075.16km?

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Look again at page 1. The three pictures you see are the three tallest free-standing structures in the world.

Freestanding: “not attached to or supported by another structure”

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## The Marshmallow Challenge

Your task is to create the tallest **freestanding** structure. To build this, you will receive: You will have 10 minutes to plan your structure and another 20 minutes to build the structure. Below are the equipment and rule list.

### EQUIPMENT:

20 pieces of Spaghetti  
1 metre of string  
30cm of sticky tape  
1 pair of scissors  
1 Marshmallow

### RULES:

- 1) The Marshmallow must sit on top of the structure. You cannot stick it into the spaghetti or with the sticky tape.
- 2) The structure must be freestanding. You are not allowed to stick it to the table or stick it to the ceiling.
- 3) The height of the structure is measured from the bottom of the structure to the top of the Marshmallow.
- 4) You are allowed to cut the string, sticky tape and spaghetti **but** only in the building stage.
- 5) You must speak in English. Every time you speak another language, 0.5cm is deducted from the overall height of your structure.

### **Stage 1: Planning: 10 minutes**

In your pairs / groups, discuss ideas for your structure. You may write and draw in this stage but you mustn't cut or break the equipment.

### **Stage 2: Building: 20 minutes**

Build the structure. You must all work together and remember the rules of the task.

### **Stage 3: Describe your structure**

Present the ideas of your structure to the class

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## Language you might need

### Raising Doubt

**I'm not so sure about the .....**

**If I was you, I would .....**

**One potential problem might be .....**

**Have you considered that the ..... Might have a problem because**

**You might run into a problem with the .....**

### Describing the decision

**We decided to** use this approach / method because .....

**In order to** stabilise the structure, we .....

**Once** the base of the structure was built, we began to .....

**Prior to** putting the Marshmallow on top, we made sure .....

**One problem we've predicted was** creating a solid foundation

### Useful Words

**Subsequently**

**Notably**

**Initially**

**Simultaneously**

**Otherwise**

**Eventually**

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## Answer Key – Buildings and Measurements

### Measurements (Bottom of page 1)

- |           |            |
|-----------|------------|
| 1. Width  | 4. Metres  |
| 2. Length | 5. Celsius |
| 3. Height | 6. Weight  |

Bonus Point: The 3 pictures at the top, from left to right are:

1. Burj Khalifa – 829m (2,722 ft) – Dubai, UAE
2. Tokyo Skytree – 634m (2,080 ft) – Tokyo, Japan
3. Shanghai Tower – 632m (2,073 ft) – Shanghai, China

### Describe the box

the height, width and length of the box are 24, 18 and 24 inches respectively.

### Measurement Quiz

1. Table Tennis table
2. 5566km
3. Christ the Redeemer
4. The Earth

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## Buildings and Measurements – Teacher’s Notes

A fantastic lesson to really bring out the creativity in your participants. The lesson builds towards the Marshmallow Challenge which is explained in the lesson and in the teacher’s guide. Before the lesson, you will need to get a few things. In order to complete the challenge, each group (3 – 5 participants each) will need:

- 20 pieces of Spaghetti
- 1 metre of string
- 30cm of sticky tape
- 1 pair of scissors
- 1 Marshmallow

You will also need to take a tape measure or long ruler to measure the height of each structure. Have fun!

# Buildings and Measurements

## Important Information:

**Aim:** To improve participant's knowledge of measurements

To improve team-work and decision-making skills

**Level:** Pre-Intermediate to Advanced

**Length of Lesson:** 60-90 Minutes (depending on extension task)

**Number of Participants required:** Minimum of 3

## Lesson Plan Stages

- 1) Begin by handing out page 1. Individually, the participants fill out the table. In pairs or groups, they then discuss their table with each other. Encourage follow-up questions and monitor for language correction (particularly on measurements). Encourage the faster finishing groups to look at the bonus question at the bottom of the table on page 1.
- 2) Feedback on language mistakes related to measurements on the board as a class. Then ask participants to complete the measurements exercise at the bottom of page 1. Here, they must match the correct word to the correct measurement. You will find the answer key on the previous page.
- 3) The next stage is a useful grammar check on the differences between how we say measurements in noun and adjective form. You can either hand out page 2 and ask them to read the grammar check or go through it with them on the board. Once you've gone through it, ask them to complete the box exercises and compare with their partner. Ask each participant to read out their answer and correct where necessary. Then group the participants and ask them to complete the measurements quiz. Answers can be found on the previous page.
- 4) The Marshmallow Challenge. This is an excellent activity and one that really brings your participants to life. I have adapted the Marshmallow challenge in this lesson to extend it a little bit and make it more enjoyable (and relaxing for the teacher!). The way I conduct the Marshmallow challenge is:
  - a. Go back to the picture of the Burj Khalifa and highlight that this is the tallest freestanding structure in the world. Elicit the definition of "freestanding."
  - b. Tell the participants that they are now going to build the tallest freestanding structure they can. List the equipment that they can use. Then list the rules of the activity (you will find these on page 3 of the worksheet). The tallest in the class wins. If you have a small group of 3, 4 or 5 participants, tell them the record is 60cm and they must beat it.

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\* A few things to note about the equipment:

Make sure you buy thick sticks of spaghetti as well as good quality string and sticky tape. I normally buy a bag of marshmallows and after handing out one to each group for the challenge, eat the rest!! Or if you're feeling generous you can hand them out to your participants :) You can also use them as mini prizes for the activities earlier on in the lesson.

- c. Then group the participants into 3's, 4's or 5's. Tell them that this is stage 1 of the activity, the planning stage. They have 10 minutes to discuss a plan for the structure. They can touch the equipment but are not allowed to cut or stick anything. Basically at the end of the planning stage, all the equipment must be exactly how they received it. Stress the rule of speaking only in English, otherwise 0.5cm will come off the total each time they are heard speaking a different language.
- d. Begin the planning stage: 10 minutes – throughout this stage monitor and walk round asking questions about the design to each group.
- e. Bring the planning stage to an end. Check to make sure the equipment of each group is back to how it was and hasn't been cut.
- f. Start the building stage: 20 minutes – I like to put a timer on the projector / Electronic Whiteboard if possible. If not, set the time on your smart phone and place in a position that can be seen by the students. This adds to the sense of pressure and realism of the challenge.
- g. Walk round and listen to the language being used for delayed error correction. Give participants time updates. I also find remind the participants about the Marshmallow as they sometimes completely forget about it. The Marshmallow must **sit** at the top of the structure. Participants mustn't stick or impale it onto the spaghetti.
- h. Be strict with time. After 20 minutes exactly ask participants to step away from the structure. If participants have finished before the 20 minutes and demand that you measure, stress that the structure must be standing after 20 minutes. Walk around and measure each structure.
- i. Extension Activity: Hand out page 4 of the worksheet and ask the participants to prepare a mini presentation on their structures, using the useful language on page 4. Pair up each group and ask them to present their mini presentations. You can also ask each group to present to the whole class if more appropriate.