

# SPACE ROCKET - LEVEL 1

Now you're going to build a space rocket using geometric shapes. Start by cutting out the geometric shapes you need to construct your rocket, and then assemble them step-by-step to make geometric solids!

## STEP 1 – CUT OUT THE SHAPES YOU NEED!

Cut along the **solid black lines** on all the shapes. You can find all the shapes to cut out on the last two pages of this document.

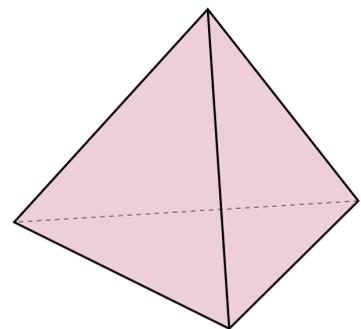
When you have finished cutting them out, you should have the following shapes in front of you:

1. Four pink equilateral triangles
2. One yellow rectangle
3. Four green squares

## STEP 2 – BUILD YOUR SPACE ROCKET!

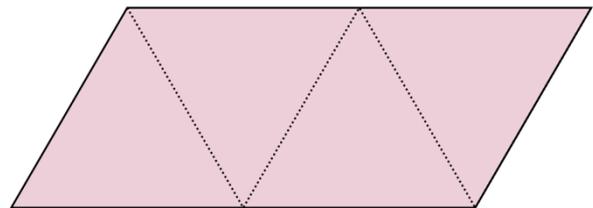
### The nose of your rocket:

The nose of your rocket will be the geometric solid called a **tetrahedron**. Build your tetrahedron using the four pink equilateral triangles. A tetrahedron looks like this:



### Build it by following these instructions:

- Place all four triangles next to each other so they form a **rhombus**. A rhombus looks like this:
- Stick some tape where the sides of the triangles meet, making sure the tape covers their entire length and all the triangles are stuck together. Then fold the triangles where the tape is, to make a three-dimensional solid.
- Tape the pieces together where they join up.



### Did you know?

Astronauts sit in the nose of the rocket when they travel into space. Perhaps you have seen a space rocket and know that they are long and thin. This is because they need lots of fuel to get into space, and all the fuel is kept in the long and narrow body of the rocket. Now it's time build the **cylinder** that will be the long part of the rocket, where all the fuel is.



Now you are going to build a **cylinder**. This will be the long part of the rocket, where all the fuel is.

### The body of your rocket:

The space rocket's body will be the geometric cylinder. You build your cylinder from the yellow rectangle. A cylinder looks like this:



### Build it by following these instructions:

- Take the rectangle you cut out.
- Place the short sides of the rectangle next to each other. Then tape them together to make a cylinder.

### Put the nose and the body of the rocket together:

You have made a tetrahedron and a cylinder, so now it's time to **put them together**. Put the tetrahedron on one end of the cylinder. Try to get it as centred on the cylinder as you can. Then tape the cylinder and the tetrahedron together. It should look like this when you have finished:



Now it's starting to look like a rocket! The last thing you need for your rocket's construction is the four fins at the bottom of the rocket.

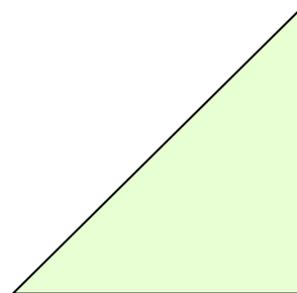
### Did you know?

Some rockets have fins at the bottom. These fins can help steer the rocket and make it more stable. You need four fins in total, and they will be made from triangles that you make from four squares.



### Build the rocket's fins

The rocket's fins will be the geometric shape called a right-angled triangle. You build the fins using the green squares. A fin looks like this:



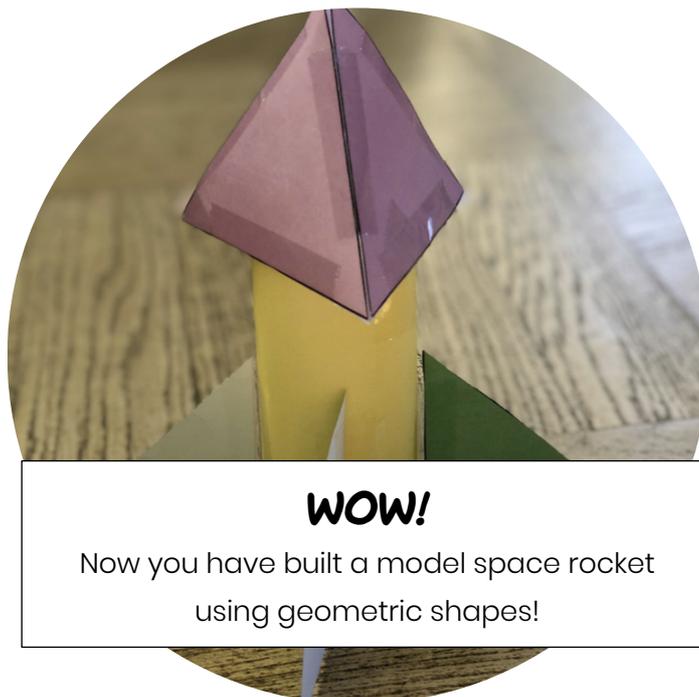
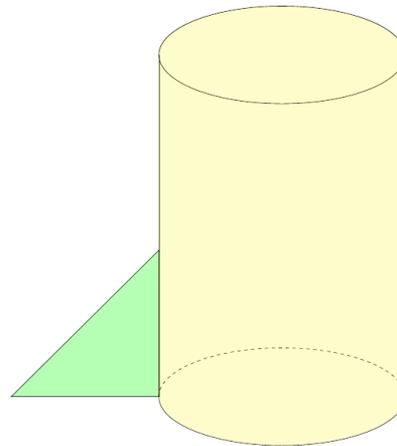
### Build your fins by:

- Folding the green squares along the dotted line so you can see the green colour on both sides.
- Taping the edges so the fin stays together, and you have a green triangle.

### Mount the fins on the space rocket:

The last thing you need to do is to put all the pieces together by taping on the fins.

- Place the **triangle** so the **right angle** is at the bottom of the rocket, like this:
- Then put a piece of tape on each side of the triangle.
- Do the same thing for all four fins.
- Try to make sure that the distance between each fin is about the same.



**WOW!**

Now you have built a model space rocket using geometric shapes!

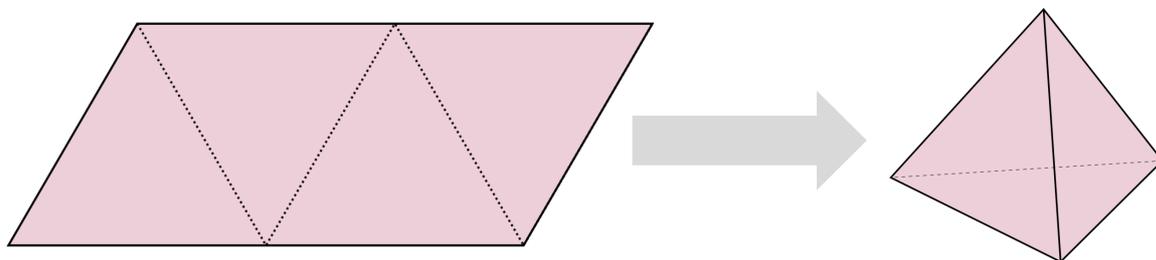


## SPACE ROCKET - LEVEL 2

Now you're going to build a space rocket using geometric shapes. You need to start by cutting out the geometric shapes you need to construct your rocket, and then assembling all the geometric shapes in stages to make geometric solids!

### STEP 1 – BUILD THE NOSE OF YOUR SPACE ROCKET

1. The nose on your rocket will be the geometric solid called a **tetrahedron**. A tetrahedron is a geometric solid made of four identical equilateral triangles. You will need four identical equilateral triangles to be able to make one. An equilateral triangle is a triangle where all the sides are the same length!
2. Measure out a **triangle** where all the sides are **7 cm** long. Make sure that every side of the triangle is exactly 7 cm before you cut it out. Once you have cut out your triangle, you can use it as a template for drawing and cutting out three more identical triangles. In total, you should have four **equilateral triangles** where all the sides are 7 cm long.
3. Now you have all the parts you need to put together the nose of the rocket, a tetrahedron. Take the four equilateral triangles you need to make the tetrahedron.
4. Place all four triangles next to each other so they form a **rhombus**. Stick some tape where the sides of the triangles meet, making sure the tape covers their entire length. Then fold the triangles where the tape is, to make a **three-dimensional** shape. Tape the pieces together where they join up.



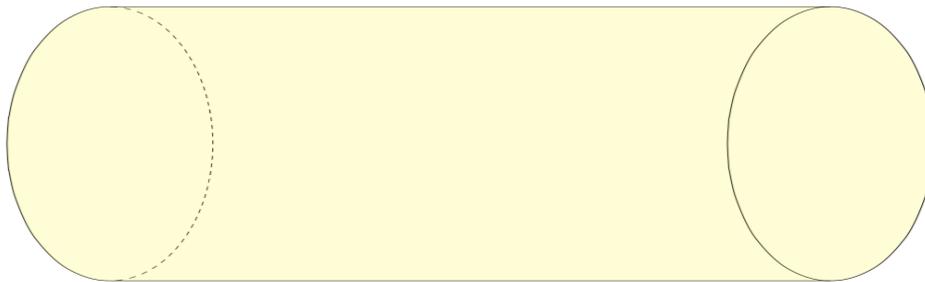
#### Did you know?

Astronauts sit in the nose of the rocket when they travel into space. Perhaps you have seen a space rocket and know that they are long and thin. This is because they need lots of fuel to get into space, and all the fuel is kept in the long and narrow body of the rocket. Now it's time build the **cylinder** that will be the long part of the rocket, where all the fuel is.



## STEP 2 – BUILD THE BODY OF YOUR SPACE ROCKET

1. The space rocket's body will be the geometric solid called a cylinder. A cylinder can be made from the geometric shape called a rectangle.
2. Measure a **rectangle where the long sides are 12 cm** and the short sides are **10 cm**. Make sure that you check the measurements before you cut out the rectangle. Then cut out the rectangle.
3. Take the rectangle you have cut out. You are going to use it to make the geometric solid called a cylinder! A cylinder is a geometric solid where the bases are two circles. One example of a cylinder that you might recognise is a fizzy drink can. To make a cylinder from the rectangle, take the rectangle's long sides and place them against each other. Then tape them together so they make a cylinder.



You have made a tetrahedron and a cylinder, so now it's time to **put them together**. Put the tetrahedron on top of the cylinder. Try to get it as centred on the cylinder as you can. Then tape the cylinder and the tetrahedron together.

Now it's starting to look like a rocket! The last thing you need for your rocket's construction is the four fins at the bottom of the rocket.

### Did you know?

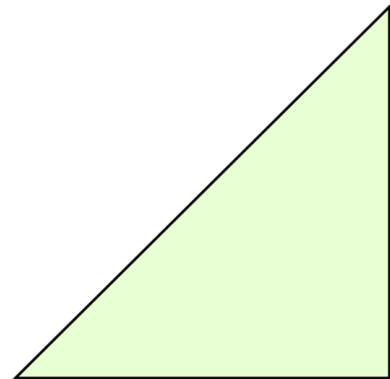
Some rockets have fins at the bottom. These fins can help steer the rocket and make it more stable. You need four fins in total, and they will be made from triangles that you make from two squares.



### STEP 3 – BUILD THE ROCKET'S FINS

1. The four fins on the rocket should be made from four identical right-angled triangles.
2. Start by drawing two squares, where each side of the square is **5 cm long**. As you know, a square is a geometric shape where all the sides are the same length. A square must also have right angles. Ask your teacher if you are unsure what a right angle is.
3. When you have drawn the squares, check that all the sides are 5 cm long. Then use scissors to cut along the lines you have drawn.
4. When you have cut out two squares, use a ruler to draw a line from the top-right corner to the bottom-left corner. This type of line is called a **diagonal**. A diagonal is the line that connects two corners that are not next to each other in a geometric shape with four or more corners. There are two diagonals in a square.
5. Then cut both squares along the diagonal line you drew. When you have done this to both squares, you have four identical right-angled triangles!

The last thing you need to do is to **put all the pieces together** by taping on the fins. Take your four right-angled triangles. Place the triangle so the **right angle** is at the bottom of the rocket. Then put a piece of tape on each side of the triangle. Do the same thing for all four fins. Try to make sure that the distance between each fin is about the same.



## STEP 4 – PERSONALISE YOUR ROCKET!

**Wow!** You have just built a model space rocket using geometric shapes. Now it's time to give your space rocket a personal touch and make it your very own. It's time to decorate it!

### Rules for decorating your space rocket:

You can decorate the rocket however you want, but there's a catch! You can only decorate the rocket using the following geometric shapes: rectangle, triangle, circle and square.

### Ideas and suggestions!

For example, you could:

- Make windows by cutting out circles, triangles or squares.
- Write your name or something else along the cylinder by cutting out rectangles and circles that you turn into letters or numbers.
- Cut out two triangles that you put together to create stars that you put on the rocket.
- ...or something completely different. The only limit is your imagination!

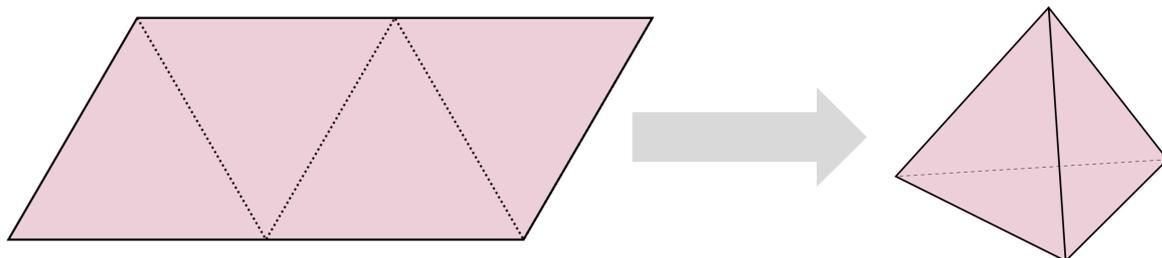


## SPACE ROCKET - LEVEL 3

Now you're going to build a space rocket using geometric shapes. Start by cutting out the geometric shapes you need to construct your rocket, and then assembling all the geometric shapes in stages to make geometric solids!

### STEP 1 – BUILD THE NOSE OF YOUR SPACE ROCKET

1. The nose of your rocket will be the geometric solid called a **tetrahedron**. A tetrahedron is a geometric solid made of four identical equilateral triangles. You will need four identical equilateral triangles to be able to make one.
2. Draw an **equilateral triangle** where all the sides are **7 cm** long. Make sure that every side of the triangle is exactly 7 cm before you cut it out.
3. Once you have cut out your triangle, you can use it as a template for drawing and cutting out three more identical triangles. In total, you should have four equilateral triangles where all the sides are 7 cm long.
4. Now you have all the parts you need to put together the nose of the rocket, a tetrahedron. Take the four equilateral triangles you need to make the tetrahedron.
5. Place all four triangles next to each other so they form a **rhombus**. Stick some tape where the sides of the triangles meet, making sure the tape covers their entire length. Then fold the triangles where the tape is, to make a **three-dimensional** shape. Tape the pieces together where they join up.



#### Did you know?

Astronauts sit in the nose of the rocket when they travel into space. Perhaps you have seen a space rocket and know that they are long and thin. This is because they need lots of fuel to get into space, and all the fuel is kept in the long and narrow body of the rocket. Now it's time build the **cylinder** that will be the long part of the rocket, where all the fuel is.



## STEP 2 – BUILD THE BODY OF YOUR SPACE ROCKET

1. The space rocket's body will be the geometric solid called a **cylinder**. A cylinder can be made from the geometric shape called a rectangle.
2. Draw a **rectangle** where all the sides add up to a total of 44 cm. The short sides of the rectangle should be **10 cm long**.
3. Before you cut out the rectangle, make sure that it measures 44 cm all the way round and that the short sides of the rectangle are 10 cm long.
4. Take the rectangle you have cut out. You are going to use it to make the geometric solid called a cylinder! A cylinder is a geometric solid where the **bases** are **two circles**. One example of a cylinder that you might recognise is a fizzy drink can. To make a cylinder from the rectangle, take the rectangle's long sides and place them against each other. Then tape them together so they make a cylinder.



You have made a tetrahedron and a cylinder, so now it's time to **put them together**. Put the tetrahedron on top of the cylinder. Try to get it as centred on the cylinder as you can. Then tape the cylinder and the tetrahedron together.

Now it's starting to look like a rocket! The last thing you need for your rocket's construction is the four fins at the bottom of the rocket.

### Did you know?

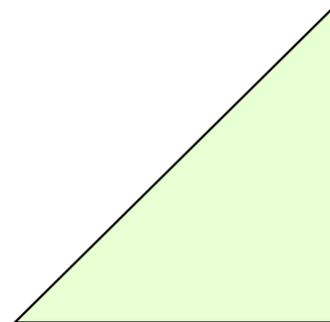
Some rockets have fins at the bottom. These fins can help steer the rocket and make it more stable. You need four fins in total, and they will be made from triangles that you make from two squares.



### STEP 3 – BUILD THE ROCKET'S FINS

1. The four fins on the rocket should be made from four identical **right-angled triangles**.
2. Start by drawing **two squares**, where the sides of each one add up to **20 cm**. As you know, a square is a geometric shape where all the sides are the same length. A square must also have right angles. Ask your teacher if you are unsure what a right angle is.
3. When you have drawn the squares, check that all the sides are equally long. Then use scissors to cut along the lines you have drawn.
4. When you have cut out two squares, use a ruler to draw a line from the **top-right corner to the bottom-left corner**. This type of line is called a diagonal. A diagonal is the line that connects two corners that are not next to each other in a geometric shape with four or more corners. There are two diagonals in a square.
5. Then cut both squares along the diagonal line you drew. When you have done this to both squares, you have four identical right-angled triangles!

The last thing you need to do is to **put all the pieces together** by taping on the fins. Take your four right-angled triangles. Place the triangle so the right angle is at the bottom of the rocket. Then put a piece of tape on each side of the triangle. Do the same thing for all four fins. Try to make sure that the distance between each fin is about the same.



## STEP 4 – PERSONALISE YOUR ROCKET!

**Wow!** Now you have built a model space rocket using geometric shapes. It's time to give your space rocket a personal touch and make it your very own. It's time to decorate it!

### Rules for decorating your space rocket:

You can decorate the rocket however you want. But there's a catch! You can only decorate the rocket using the following geometric shapes: rectangle, triangle, circle and square.

### Ideas and suggestions!

For example, you could:

- Make windows by cutting out circles, triangles or squares.
- Write your name or something else along the cylinder by cutting out rectangles and circles that you turn into letters or numbers.
- Cut out two triangles that you put together to create stars that you put on the rocket.
- ...or something completely different. The only limit is your imagination!

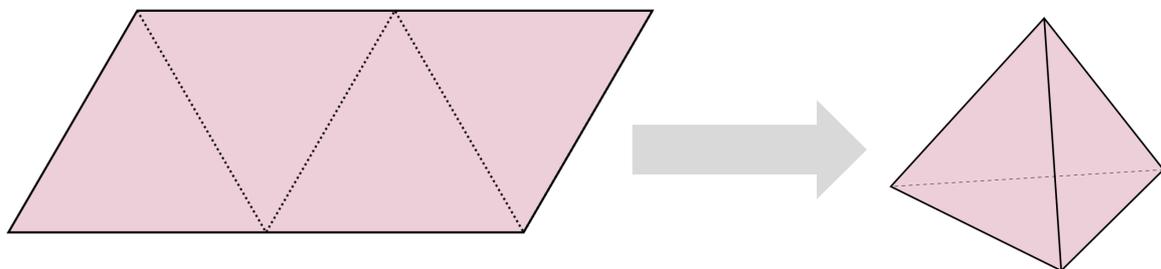


## SPACE ROCKET - LEVEL 4

Now you're going to build a space rocket using geometric shapes. You need to start by cutting out the geometric shapes you need to construct your rocket, and then assembling all the geometric shapes in stages to make geometric solids!

### STEP 1 – BUILD THE NOSE OF YOUR SPACE ROCKET

1. The nose of your rocket will be the geometric solid called a **tetrahedron**. A tetrahedron is a geometric solid made from four identical equilateral triangles, so you will need four identical equilateral triangles to be able to make one. An equilateral triangle is a triangle where all the sides are the same length!
2. Draw an **equilateral triangle** where all the sides add up to **21 cm**. Check that all the sides are the same length and then cut out your triangle. Once you have cut out your triangle, you can use it as a template for drawing and cutting out three more identical triangles. In total, you should have four equilateral triangles, each of which has sides that add up to 21 cm.
3. Now you have all the parts you need to put together the nose of the rocket, a tetrahedron. Take the four equilateral triangles you need to make the tetrahedron.
4. Place all four triangles next to each other so they form a **rhombus**. Stick some tape where the sides of the triangles meet, making sure the tape covers their entire length. Then fold the triangles where the tape is, to make a **three-dimensional** shape. Tape the pieces together where they join up.



#### Did you know?

Astronauts sit in the nose of the rocket when they travel into space. Perhaps you have seen a space rocket and know that they are long and thin. This is because they need lots of fuel to get into space, and all the fuel is kept in the long and narrow body of the rocket. Now it's time build the **cylinder** that will be the long part of the rocket, where all the fuel is.



## STEP 2 – BUILD THE BODY OF YOUR SPACE ROCKET

1. The space rocket's body will be the geometric solid called a **cylinder**. A cylinder can be made from the geometric shape called a rectangle.
2. Draw a **rectangle** that has a total area of **120 cm<sup>2</sup>**. One of the sides of the rectangle should be **10 cm** long. Before you cut out the rectangle, make sure it has an area of 120 cm<sup>2</sup> and that at least one side is 10 cm long.
3. Take the rectangle you have cut out. You are going to use it to make the geometric solid called a cylinder! A cylinder is a geometric solid where the **bases** are **two circles**. One example of a cylinder that you might recognise is a fizzy drink can. To make a cylinder from the rectangle, take the rectangle's long sides and place them against each other. Then tape them together so they make a cylinder.



Now you have made a tetrahedron and a cylinder, so it's time to **put them together**. Put the tetrahedron on top of the cylinder. Try to get it as centred on the cylinder as you can. Then tape the cylinder and the tetrahedron together.

Now it's starting to look like a rocket! The last thing you need for your rocket's construction is the four fins at the bottom of the rocket.

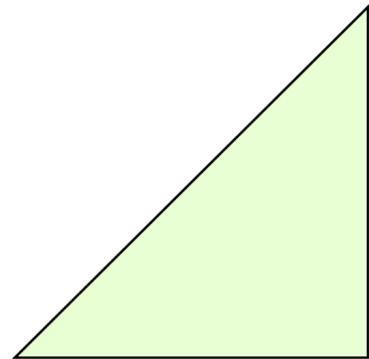
### Did you know?

Some rockets have fins at the bottom. These fins can help steer the rocket and make it more stable. You need four fins in total, and they will be made from triangles that you make from two squares.



### STEP 3 – BUILD THE ROCKET'S FINS

1. The four fins on the rocket should be made from four identical **right-angled triangles**.
2. Start by drawing **two squares**, both with an area of **25 cm<sup>2</sup>**. As you know, a square is a geometric shape where all the sides are the same length. A square must also have right angles. Ask your teacher if you are unsure what a right angle is.
3. When you have drawn the squares, check that the area of each one is 25 cm<sup>2</sup>. Then use scissors to cut along the lines you have drawn.
4. When you have cut out two squares, use a ruler to draw a line from the **top-right corner to the bottom-left corner**. This type of line is called a diagonal. A diagonal is the line that connects two corners that are not next to each other in a geometric shape with four or more corners. There are two diagonals in a square.
5. Then cut both squares along the diagonal line you drew. When you have done this to both squares, you have four identical right-angled triangles!



The last thing you need to do is to **put all the pieces together** by taping on the fins. Take your four right-angled triangles. Place the triangle so the right angle is at the bottom of the rocket. Then put a piece of tape on each side of the triangle. Do the same thing for all four fins. Try to make sure that the distance between each fin is about the same.



## STEP 4 – PERSONALISE YOUR ROCKET!

**Wow!** Now you have built a model space rocket using geometric shapes. It's time to give your space rocket a personal touch and make it your very own. It's time to decorate the rocket!

### Rules for decorating your space rocket:

You can decorate the rocket however you want. But there's a catch! You can only decorate the rocket using the following geometric shapes: rectangle, triangle, circle and square.

### Ideas and suggestions!

For example, you could:

- Make windows by cutting out circles, triangles or squares.
- Write your name or something else along the cylinder by cutting out rectangles and circles that you turn into letters or numbers.
- Cut out two triangles that you put together to create stars that you put on the rocket.
- ...or something completely different. The only limit is your imagination!

