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extracts from

You Do the Maths: Launch a Rocket into Space

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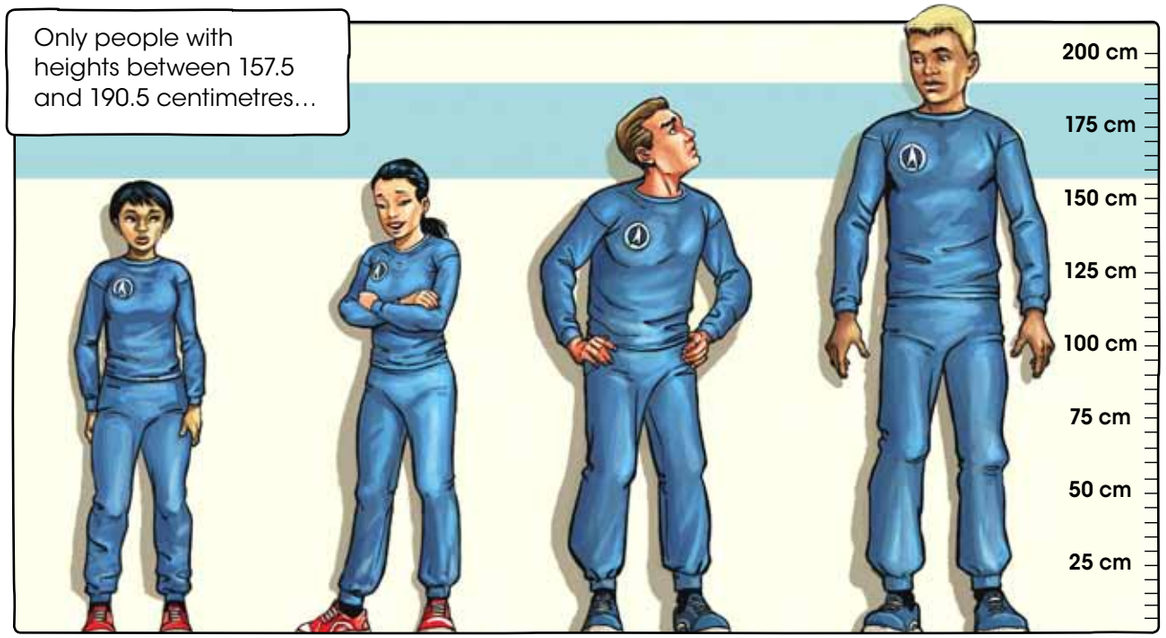
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ASTRONAUT SELECTION

You have been chosen to lead a mission into space and your first task is to select astronauts for your team. Choosing astronauts for space missions is difficult. Applicants must have the correct qualifications and experience.

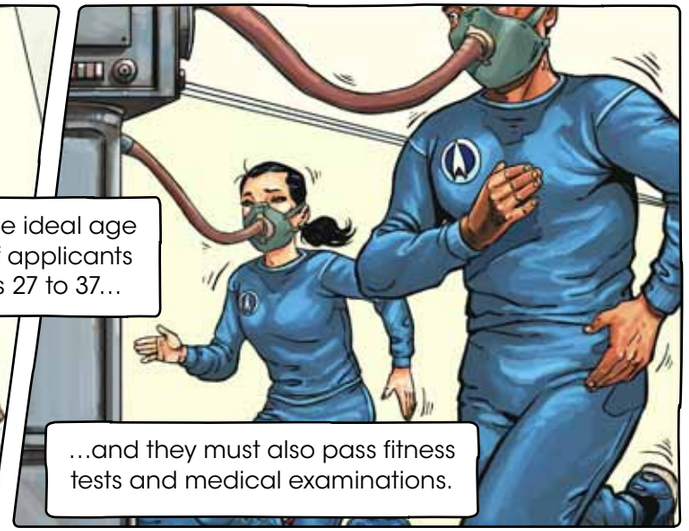
Only people with heights between 157.5 and 190.5 centimetres…



…and perfect, or '20/20', eyesight can apply to become astronauts.



The ideal age of applicants is 27 to 37…



…and they must also pass fitness tests and medical examinations.

This table shows nine people who would like to join your mission.

ASTRONAUT CANDIDATES

NAME	GENDER	AGE	HEIGHT	EYESIGHT	✓ / ✗
Urvi Patel	Female	26	154.9 cm	20/20	
Brad Winchester	Male	30	157.3 cm	not 20/20	
Connor Wood	Male	28	177.0 cm	20/20	
Zoe Hurworth	Female	32	164.3 cm	20/20	✗
Samuel Wilkinson	Male	41	192.4 cm	20/20	
Kamelia Horacia	Female	37	166.2 cm	not 20/20	
Emily Smith	Female	39	158.1 cm	20/20	
Brendon Burke	Male	29	187.2 cm	20/20	
James Morton	Male	38	210.5 cm	20/20	

1. *How many of the candidates are within the preferred age range?*
2. *Which of the candidates have the correct height to be an astronaut?*
3. *Three of the candidates have the correct height, the preferred age and 20/20 eyesight. Who are they and are they male or female?*

WHAT ABOUT THIS?

Find out your own height and see how much more you need to grow to be able to apply to be an astronaut. How much older do you need to be?

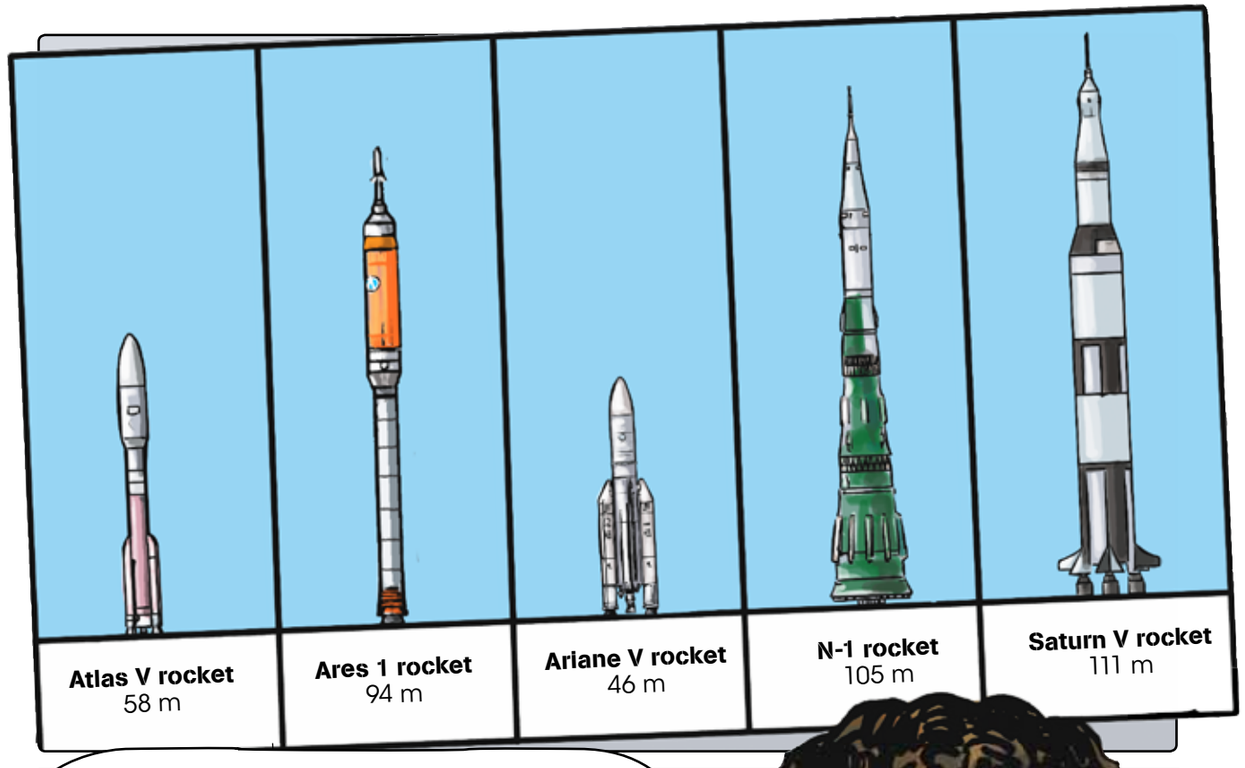
THE SIZE OF ROCKETS

Rockets that carry spacecraft or satellites into space have to be really large. This is to hold all the fuel needed. Your next job is to look at other rockets to see how big yours needs to be.

Did you know that a space rocket can be taller than a 30-storey building?

This table shows the heights of some famous buildings and rockets.

NAME	HEIGHT
Statue of Liberty (New York)	93 m
Westminster Abbey (London)	69 m
St Paul's Cathedral (London)	111 m
Arc de Triomphe (Paris)	50 m
Atlas V rocket	58 m
Ares 1 rocket	94 m
Ariane V rocket	46 m
N-1 rocket	105 m
Saturn V rocket	111 m



1 *How much taller is:*
a) the Atlas V rocket than the Arc de Triomphe?
b) the Ares 1 rocket than Westminster Abbey?
c) the Saturn V rocket than the Statue of Liberty?

2 *List the five rockets in order of height from shortest to tallest.*

3 *Which rocket is:*
a) the same height as St Paul's Cathedral?
b) 12 metres taller than the Statue of Liberty?
c) 23 metres shorter than Westminster Abbey?

4 ***Round** the height of each building and rocket to the nearest 10 metres.*

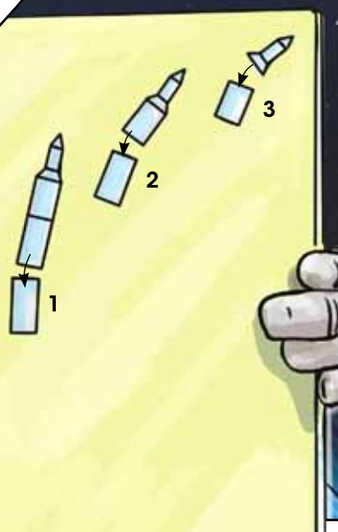
WHAT ABOUT THIS?
Find out the height of other tall buildings in your country and see how much taller they are than the rockets listed here.

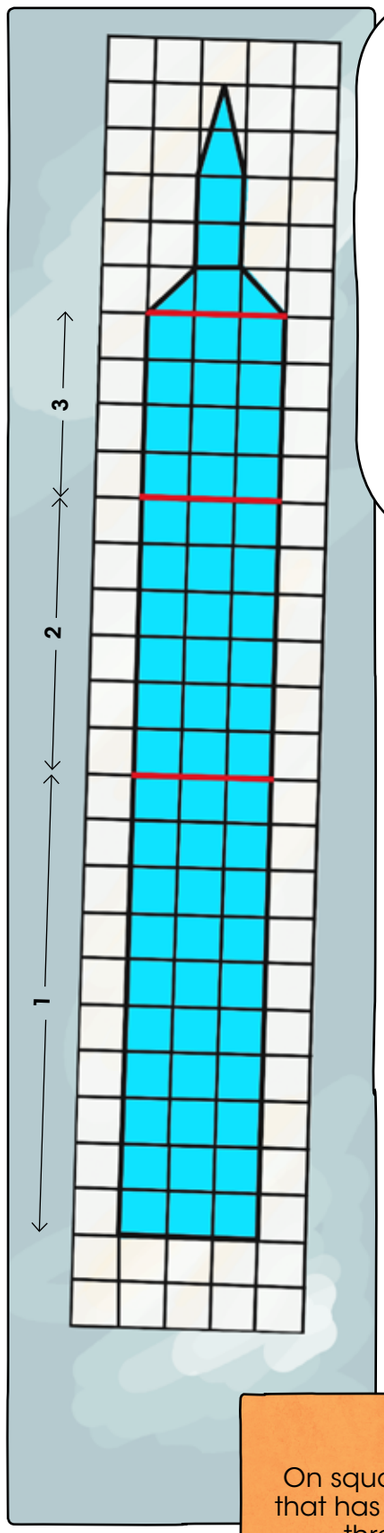
ROCKET CONSTRUCTION

A space rocket is built in several parts, called stages. Each stage has its own fuel and rocket engine. Your rocket will need three stages to carry it to outer space.

As the fuel in each stage is burnt up, the stage comes off and falls back to Earth.

Here, stages 1, 2 and 3 drop off leaving only the upper stage to travel into space.





1 Count the number of squares in this picture for:
a) stage 1 b) stage 2 c) stage 3
d) stages 1, 2 and 3 added together.

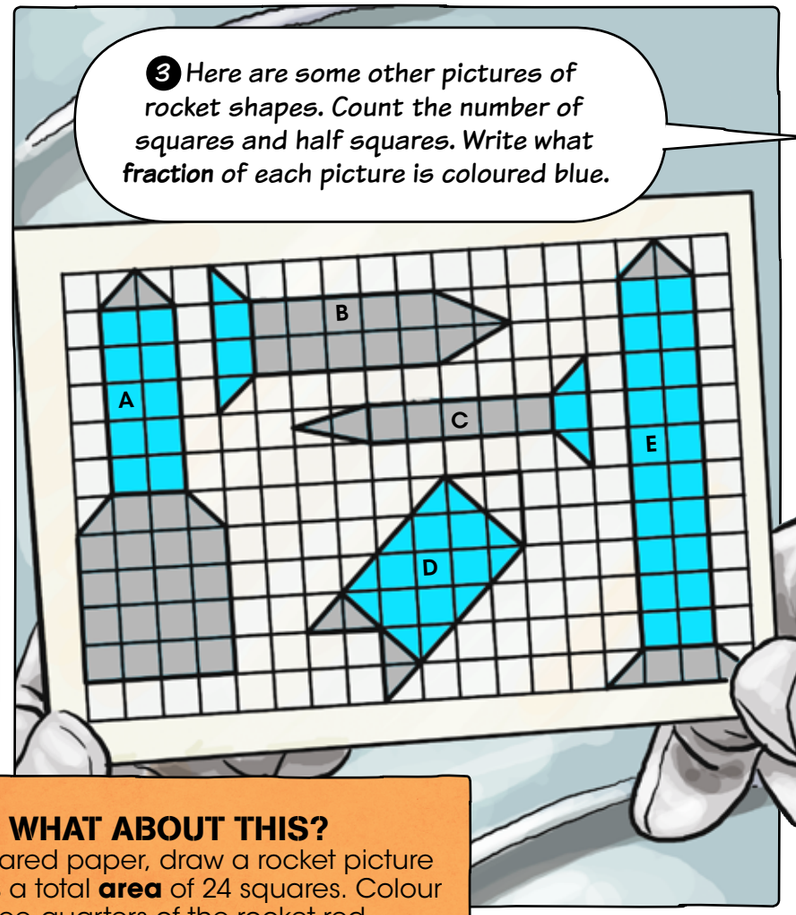
2 True or false?
a) Stage 1 is ½ the size of stages 1, 2 and 3 put together.

b) Stage 3 is ⅕ of the size of stages 1, 2 and 3 put together.

c) Stage 2 is ¼ of the size of stages 1, 2 and 3 put together.



3 Here are some other pictures of rocket shapes. Count the number of squares and half squares. Write what **fraction** of each picture is coloured blue.



WHAT ABOUT THIS?
On squared paper, draw a rocket picture that has a total **area** of 24 squares. Colour three-quarters of the rocket red.