



## GCSE Science

### How to answer extended writing (6 mark) questions

The new GCSEs in Science have slightly different style exam papers to the old courses. One of the big differences is that the new papers have questions worth 6 marks. These questions will ask you to write longer answers than you might be used to.

So, in this guide, we'll try and show you some ways to cope with these new questions. We'll look at some examples of questions - and some answers to them - so that you can get used to the sorts of questions that may come up. You'll also see some examples of how other students have come up with answers to them.

Probably the most important piece of advice to give you at the start of this guide is - DON'T PANIC! OK, some of these new questions might look a bit scary - there's more reading than most other questions and a much bigger space for you to write your answer.

But, look on the bright side. The bit of reading before the question may contain some information that can actually help you answer the question. And the answer space has to be big because some people have really big writing – and other people will write whatever comes into their heads! Remember that you don't need to fill all that space – even writing one or two sentences can provide enough information to start scoring marks.

### Know your enemy

#### Where will these 6-mark questions appear?


All of Edexcel's exam papers have the same format, so the exam paper that you sit will look the same as any practice papers that you've taken. At least this means that you won't get a nasty surprise when you sit the exam for real.


So, the question paper that you sit will have 6 questions in it, each broken up into several parts. You'll find that the 6-mark parts will be in the later parts of the paper (Questions 4, 5 or 6), and probably towards the end of each of these questions.

Each exam paper you sit will have two 6-mark questions.

#### What sort of topics will they cover?

These questions need more than just a few words as an answer, so they're likely to be based on several linked statements from the specification, or possibly on one statement that's particularly 'meaty'.





The examiners try and make sure that the questions cover a range of different topics. They also like to make sure that the two 6-mark questions aren't both about recalling and writing down a lot of knowledge. So, there's a good chance that at least one of the questions will be about some practical work that you've done, or give you some data to look at, or ask you to come up with reasons for and against an idea or argument.

### How are they marked?

You're probably used to the way in which most questions are marked – so, for a 1-mark question, you make one point and for a 2-mark question you make two points and so on.

However, these questions are slightly different – you'll be glad to know that you don't have to make six points in order to score six marks!

Instead, these questions are placed in bands - or levels - depending on the quality of science that you've shown in your answer. The table below gives some information about how these bands or levels are arranged, and what you might have to do to achieve them. Note that this is only a guide – some questions may need to have slightly different mark schemes because of the question that is asked.

Level	Number of marks	Typical answer
0	0	Most likely to be no answer given; or a very short answer that doesn't really answer the question asked.
1	1 - 2	One or two sentences that contain some information that answers the question asked.
2	3 - 4	A good answer which contains at least two good ideas. In the case of a question involving a balanced argument, both sides of the argument will be considered. Answer may still be quite short – two or three sentences. There is likely to be some use of relevant scientific words.
3	5 - 6	An answer that contains several good ideas or pieces of information. It is likely to have considered different aspects of the science. Again, it doesn't have to be long – a few sentences may be enough! There is likely to be good use of relevant scientific words.



## Hints and tips

It might be easier to see how the “Hints and Tips” relate to a real question, so let’s have a look at one of the questions from the specimen papers for GCSE Science. This one’s from the Chemistry Foundation Tier Paper:

- \*(d) Chlorine is used in the manufacture of the polymer poly(chloroethene) (PVC). Other similar polymers include poly(ethene) and poly(propene). These polymers have similar properties and are widely used in everyday life.

Describe a use for each of these polymers and explain how the properties of the polymers relate to their uses.

(6)

Let’s have a little think about what this question is asking us to do, and what information there is in the question to help us.

Well, the question itself – the last sentence – is really asking you to give a use for some polymers and to say what property the polymer has that makes it useful.

That sounds quite hard... until we read the introduction. OK, there’s a lot of long chemical names in the introduction, but those first three sentences are essentially just saying, “Here are three examples of useful polymers: poly(ethene), poly(propene) and poly(chloroethene) or PVC”.


So, the question really boils down to this: “Give a use and a property for poly(ethene), poly(propene) and PVC”. Well, that doesn’t sound too hard – as long as you’ve learnt that bit of the specification of course! The part of the specification this question tests is statement 5.35 in Unit C1 (and section C1.33 of the Edexcel Science Student Book).

### How am I going to structure my answer?

Your answer needs to be clearly set out, but it doesn’t have to be in a long block of written text. Of course, if you want to write out lots of sentences, you can, but you can also present the information in other ways.

So, you could draw a table and use this to present your answer:

Polymer	Use	Property
poly(ethene)		
poly(propene)		
PVC		



Or, you could use a series of bullet points or sub-headings:

poly(ethene)  
Use =  
Property = .....

All of these methods are completely fine. Remember, it's the science that the examiner will be looking for. This doesn't mean that your presentation can be dreadful, but it does mean that you don't have to write a long piece of text – you can present the information in any way which is logical and sensible.

### *What's the minimum I can write and still score some marks?*

This will vary from question to question, of course. Remember when we looked at the way in which these are marked? We saw that answers were placed in 3 bands. In this question you're asked for a use and property for three different polymers. So, if you get a use and property for one of those polymers, that's enough to be in the lowest band and to score some marks.

What about if you know the uses, but you're not sure about the properties? Usually, you'll also get some marks if you list a couple of the uses, or just a couple of properties.

So, the following responses will all score at least 1 mark:

**“PVC is used to make water pipes, because it's quite tough and strong.”**

**“Poly(ethene) is used to make carrier bags and PVC is used to cover electrical wires.”**

**“Polymers like poly(ethene) are unreactive and can easily be made into different shapes.”**


### *How can I make sure my answer is in the top band?*

Here, you really need to be giving the use and property for each of the three polymers listed, although if you miss out one piece of information, you might still get into the top band.

You're more likely to get the benefit of the doubt in situations like that if:

- your answer is well-structured
- you've tried hard to use a range of scientific or technical words
- you've tried to make sure that you've spelled everything correctly.





So, an answer in the top band could read like this:

**“Poly(ethene) : this is a very flexible material that can be easily shaped. It is also waterproof and can be used to make food bags.**

**Poly(propene) : this is a strong polymer and is often used to make ropes or fibres.**

**PVC : this is hard-wearing and waterproof and is often used to make window frames.”**

Note how few words there are in this answer – it just shows you that these questions can be answered with short, punchy answers. Quantity isn’t as important as what you actually say!

### More open questions

The question we looked at above was quite simple in some ways. The question gave you all the information you needed, and it was possible to break the question down into something quite understandable – an answer showing a use and a property for each of the polymers.

However, some questions can be a little more difficult to work out what to say – not because they are harder, but because the question is a little more “open” and you have to think more about what to say to answer the question.

Here’s an example from one of the Physics specimen papers:

\*(c) Some scientists think that there could be simple life on Europa.

We have already sent successful manned expeditions to our Moon.  
There is now a proposal to send a manned expedition to Europa.


Using evidence and opinions, discuss why this is unlikely to happen in the near future.

(6)

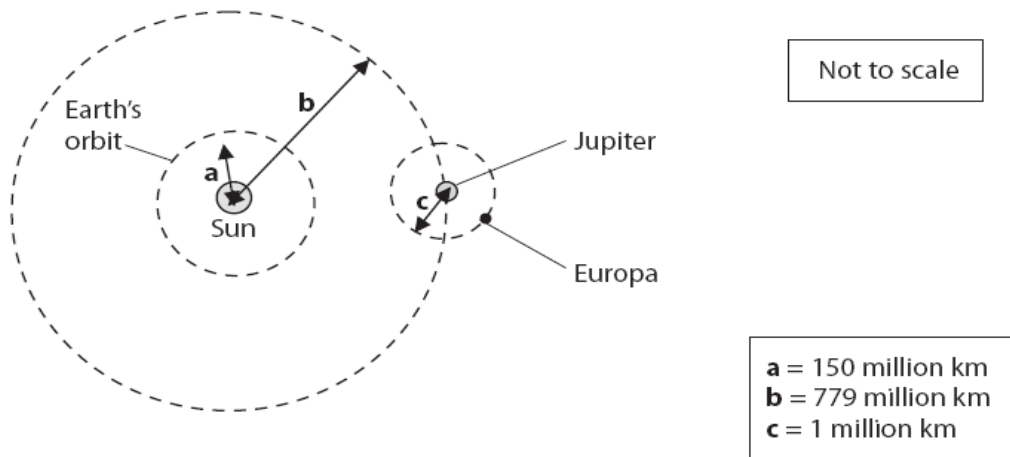
In this case, there isn’t really one fixed answer – different students will approach it in different ways. This is a good thing, because it means that there are many different ways to answer the question.

The important things to remember are the hints we looked at earlier – make sure you use some scientific ideas, make sure you use some good scientific words and take care that what you write is presented well, makes sense and contains good English!

Let’s look at the question again and see what we’re being asked to do. The first three sentences are really just setting the scene for the question – they’re saying that we’ve sent people to the Moon and now we’re thinking about sending people to Europa.



For those of you that are thinking to yourself “I’ve never heard of Europa!”, don’t panic! Notice that this is part (c) of a question – the earlier parts of the question, (a) and (b), were all about Europa and explained that Europa is a moon of the planet Jupiter. There was even a very handy diagram giving some ideas about the distances involved:



So, the question has told us that the distance from the Earth to Europa is a very long way. (For those of you who are good at Maths, you can see that the distance is  $b - c - a$  or 628 million km).

Look at the last sentence of the question – this is what you’re actually being asked to do. The key word here is “discuss” – this is one of those special words that examiners use. It means “talk about” – so, just like a debate, your “discussion” should look at both sides of the argument.

So the question is really saying: “Do you think we will send people to Europa?” but also asking you to think about reasons to back up your ideas.

Remember that there are no absolute right and wrong answers here – the examiners are looking for the ideas that you have that show your knowledge of the science, and that show that you can consider both sides of the argument – in this case, whether you think that it is possible or not possible to send people to Europa.

One way to plan your answer to this question could be to draw out a table like this:

<u>Why it is possible</u>	<u>Why it is not possible</u>
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Then, under each of the headings, you could list the factors that are important. You might find it useful to link these together. So, if one of your arguments under “Why it is not possible” is “Europa is a very long way away”, you could link it to a statement in the “Why it is possible” column that says “You can get to Europa within a person’s lifetime”. Or, you could give some detail about why the distance is a problem e.g. the spacecraft would have to carry lots of food.



### Some possible answers

A basic (Level 1) answer will probably just list a few factors, not really give pluses and minuses for each of them, and probably not have an overall conclusion. It also won't go into detail on any of the factors mentioned either. So, it might look something like this:

**“We won't send people to Europa because it is a long way and will take too long to get there. Also, it would be very expensive.”**

So, how can we improve this to make a good (Level 2) answer? Well, we could try and explain the first point about the distance to travel and make it sound a bit more scientific. We could also try and think of another factor, and come up with some kind of conclusion. So, how about:

**“Europa is much further away than our own Moon, so it would take a long time to get there. This would be a problem, because the spacecraft would need to be very big to take all the food that the people would need on the journey. Also, because of the distance it would be more difficult to keep in contact with the spacecraft. These factors would make the trip cost too much money, so I do not think that it is likely that people will go to Europa for many years.”**

Notice how the first sentence uses some extra information – that Europa is further away than our Moon. You're using information from the question – but an examiner will think, “This candidate knows some science”, which is definitely going to help the mark you get!

Lastly, how can we make this into an excellent (Level 3) answer? Both of our previous answers looked at problems, but didn't look at solutions or alternatives. If there are more factors we could talk about, then we could bring them in too. So, our Level 3 answer might be:

**“It is quite easy to send people to the Moon, as it is not far away. Europa is much further. It would take many years to get there, so the spacecraft would need to take more food and might be too big to take off! It is possible that this could be solved by the people growing their own food on the journey. The spacecraft would also need enough oxygen to keep the people alive, as there is no oxygen in space. This would all cost a lot, so it would be difficult to imagine this project happening. Finally, we have already sent unmanned satellites out to this part of our Solar System, so perhaps we should use this type of project in the future to gather more information. This would be better than sending people out on a dangerous and long journey.”**

Note that these answers are quite long – mostly because we've used full sentences. “Discuss” questions are likely to need longer answers – but you could save time and space by using bullet points to make your arguments. It's probably also fair to say that the Level 2 answer here is a very good one – you'd almost certainly get to Level 2 with less information. And the Level 3 answer is almost perfect – but it's good to know what you're aiming for!

