

The STEM Careers Activity Pack for Parents



Welcome to the Future Morph – STEM Careers Activity Pack for parents. This pack has been designed specifically with parents in mind so that you can work through the activities with your children and help to show them the relevance of science and maths, not only in their future careers, but in their everyday lives.

For those of you who are wondering what STEM actually means it is simply an acronym for Science, Technology, Engineering and Mathematics.

Future Morph is a web-based initiative (www.futuremorph.org) that has been designed to engage young people and encourage them to appreciate why they study science and maths in school and to understand the breadth of opportunities that are available from studying STEM. The website aims to build an awareness of the skills developed by studying science and maths and how they help keep options open.

Future Morph – become someone

We are hoping that you encourage your children to work their way through some (if not all!) of the activities within this pack, where they will come across some of the amazing and unexpected places that studying science, technology, engineering and maths can take them.

Once they have completed the activities, don't forget that www.futuremorph.org will still be there and can help them to really think about their future career. We even have a parents section to help you assist your children in making their future career decisions and finding out the best options for them. Our door is always open so feel free to log on and explore.

The list below shows you the careers activities that we have included in this pack. Most, if not all, do require you to go to the Future Morph website but if that is not possible within lesson time they can always be adapted for your own use. Please make them your own and who knows where the future will take your children...

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About this pack:

Mostly for 11–13 year olds, these activities will also suit 14–16 year olds. Organisers will need to consider the ability range of their particular students. Most of the activities require the use of a computer to log onto the Future Morph website (www.futuremorph.org).

Any one of the activities can be carried out on a stand alone basis, for use in part of a session. If more time is available, organisers might select a set of activities, based on materials and resources to hand, for the students to get a broad idea about the huge range of STEM careers available.

Recent research from the UKCES report (UKCES UK Commission for Employment and Skills. 'Skills for Jobs: Today and Tomorrow.' Volume 2: The Evidence Report. The National Strategic Skills Audit for England 2010) shows us that by the year 2017, 58% of new jobs will be in the field of STEM which is why it is increasingly important to make sure that young people are aware of the range and variety of jobs available in this area.

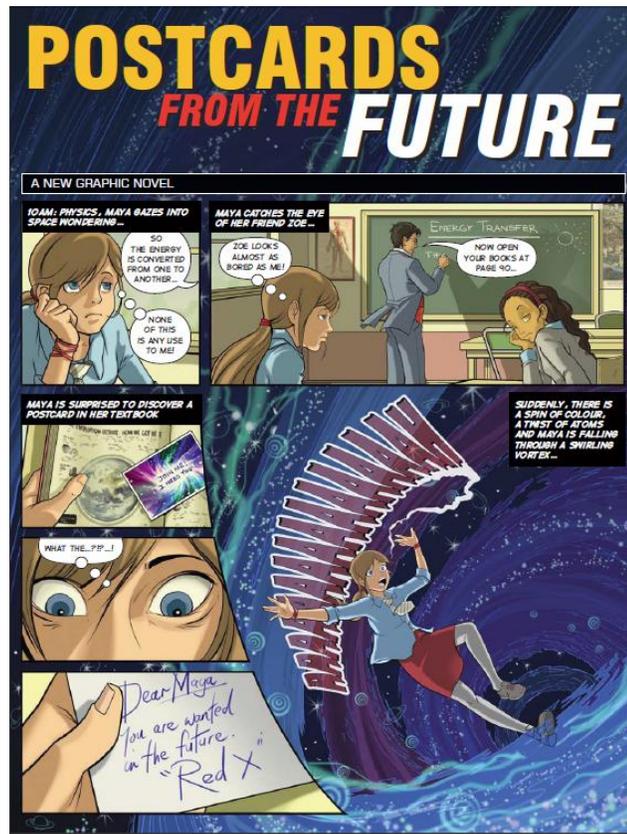
The world around us is changing and we are going to need more scientists. Current environmental changes will bring about the need for flood specialists and climate researchers for example; the demographic change that we are experiencing and the fact that we are now becoming a much more ageing population will demand an increased healthcare service; the technological changes of recent years only force us to imagine where we could be within the next 5, 10 and even 50 years with human/robot interaction specialists and nano-medics – the possibilities really are endless!

It is important for students to learn that studying science and maths is not a one track road to a life in a laboratory, but the skills that they will learn from these subjects are extremely valuable to employees and will help them to keep their options open.

We must ensure that students are aware of the huge relevance that science and maths have on our everyday lives.

Activity 1: Careers postcards

Who is sending messages from the future and could this help you in thinking about the huge variety of careers that are available from studying science and maths?



Talk about:

- What jobs do you already know about that use science and maths?
- Have you received any careers advice and was it helpful?
- Who would you go to for help and advice about careers?
- Would you use the internet to search for jobs?
- Why might science jobs become more important in the future?
- Can you think of any science role models (male and female)?

Careers postcards: Organiser's notes

What do I do?

1. Click on the following website to download the comic book:
<http://www.theukrc.org/wise/for-girls/postcards-from-the-future>
2. Read the character profiles on the site about the scientists that Maya meets on her journey.
3. Give the students time to consider their own questions that they would want to ask these scientists and the reasons behind their choices.
4. Ask the students to design their own cartoon strip for STEM (Science, Technology, Engineering and Maths) careers.
 - This could be looking at STEM careers from the past, present, or why not challenge them to think about the careers that will exist in the future using science or technology.
 - Students can develop their own characters with their own names and personalities.
 - Make sure that you try to encourage them to show both male and female characters as everyone can work in STEM.
 - Discuss with the students who they would like to meet to help them make their future career choices. If they have a scientific role model they may like to include them in their story.
 - Have students look at each others comic books to see who they chose to meet and what their characters found out from their journey.
 - Challenge students to come up with their own idea to highlight STEM careers within a comic book format.
5. Ask the students to write their own character profiles for the scientists that they meet within their comic book. They can come up with their own questions about what they would like to know, but they could also provide their own answers which could then work as a basis for a class discussion.

Activity 2: Quiz the Scientist

If you met a scientist what would you want to ask them? Maybe it would be 'What is the most dangerous thing they have done?' or 'If they weren't a scientist what would they have been?' You might also want to consider your interview techniques, e.g. would you use a Dictaphone to record the interview or would you simply write the answers down? Would you interview them in a classroom or studio-style setting, or would you go to their place of work and use a digital camera to capture an image of the scientist at work or a video camera so that your audience could watch the scientist carrying out their daily tasks whilst answering your questions? Think about who your audience would be, what they would prefer and where your interview would go so that people could see it?



Talk about:

- Which scientists would you want to ask questions to?
- Are there any particular jobs that you would like to find out more about but you don't know whether they use science or maths?
- How long should your interview last?
- How many questions would you ask?
- Where will your interview be displayed once it is complete?
- Would you ask the questions yourselves or would you ask someone else to do it? (e.g. a celebrity, scientific role model, or maybe a colleague of the person you are interviewing)
- Don't forget to include questions about how they got to where they are today (e.g. subjects studied at school) and what they like to do when they are not at work. Remember scientists are real people too!

Quiz the Scientist: Organiser's notes

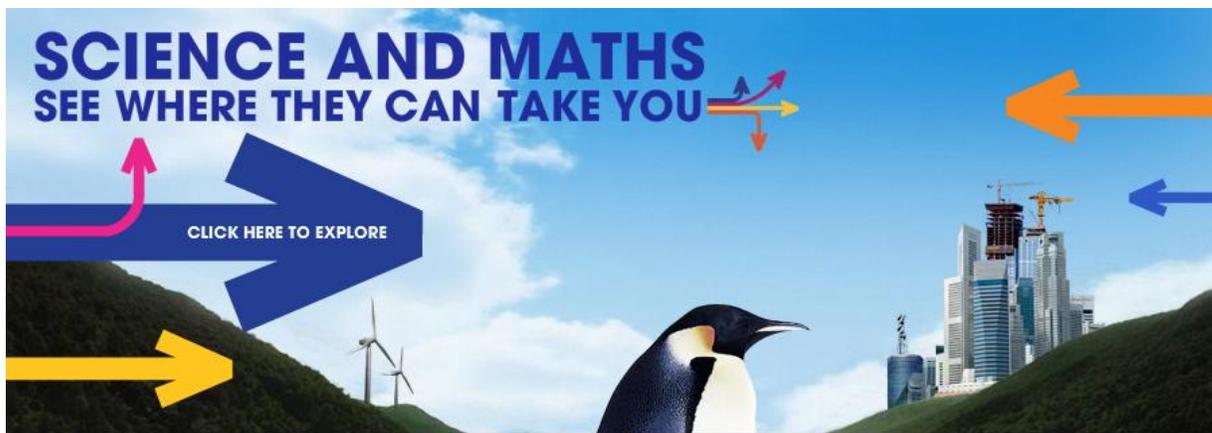
What do I do?

1. Go to the Future Morph website and have a look at the 3 different quiz the scientist clips:
Part 1: <http://www.futuremorph.org/11-13/quiz-the-scientist-part-1/>;
Part 2: <http://www.futuremorph.org/14-16/quiz-the-scientist-part-2/>;
Part 3: <http://www.futuremorph.org/16plus/quiz-the-scientist-part-3/>
2. You may also want to have a look at some of the career profiles on Future Morph to have a look at the range of questions and to see how asking 'unusual or unexpected' questions may help to bring the scientists to life. Have a look at this one of Tamsin, an Antarctic Meteorologist, as an example:
<http://www.futuremorph.org/11-13/case-studies/tamsin-antarctic-meteorologist/>
3. Give the students time to consider their own questions that they would want to ask these scientists.
4. The students should first decide what the role of the scientist is who they would like to question, e.g. are they a chemical engineer, zoologist or botanist?
5. Students should come up with a list of 10 open questions.
6. Students could complete this task in pairs, groups or individually to come up with as many questions as they can.
7. If possible, arrange for a scientist(s) to come into your school for an afternoon so that the students can ask their questions to a professional. They could even record or film this interview and then use it in the future to highlight STEM careers in your school.

Activity 3:

Science and Maths – See where they can take you

This site was produced by the Department of Education and is now hosted on Future Morph so that you can see a whole range of careers in science and maths that you may be interested in. The site includes a range of career profiles from cosmetics specialists and games developers, to marine biologists and sports technologists. Each career profile includes information on salary, work/life balance, favourite aspects of the job etc, as well as a video profile and various photographs to highlight each job and bring it to life for the students. Links are also included so that students can click through for further information on jobs that interest them.



Talk about:

- What do each of the jobs mentioned on this site involve?
- Do the students already know anyone who does one of these jobs?
- Which aspects of each of the jobs do the students like/dislike?
- If the students could carry out one of these jobs for a day which one would they choose and why?
- Encourage a class debate on the advantages and disadvantages of each of these jobs.
- What information not included in these profiles do the students think are missing?
- What impact do the photographs and videos have on demonstrating the work involved in each job?

Science and Maths – See where they can take you: Organiser's notes

What do I do?

1. Go to the Future Morph website and have a look at the section 'Science and Maths – see where they can take you':
<http://www.futuremorph.org/parents/play/science-and-maths-see-where-they-can-take-you/>
2. You may also want to have a look at some of the career profiles on Future Morph to have a look at the range of questions and to see how asking 'unusual or unexpected' questions may help to bring the scientists to life. Have a look at this one of Tamsin, an Antarctic Meteorologist, as an example:
<http://www.futuremorph.org/11-13/case-studies/tamsin-antarctic-meteorologist/>
3. Ask the students to pick one of the careers and find out as much information as they can about it. This could form part of a class project where each individual in the class has to pick a different STEM career to research and then when they have completed their project they must design a presentation to feedback to the class on what they have found out.
4. Information to include could range from subjects needed to study at A-level, degree subject if applicable, whether this career can be obtained via the apprenticeship route, average salary, work vs. life balance, whether it appears to be more favoured by one gender than the other, average hours per day spent working, whether the job is lab, office, outdoor-based or other, etc. You can include as much or as little information as you would like – it's your project.
5. You may choose to compile a table with these suggestions as headings for the students to fill in details for each section as appropriate for their chosen career.
6. Students could use the Future Morph website to find out as much as they can about their chosen career, but why not also let them explore other websites as well as any other resources that are available to you.
7. You could also try to speak to a professional working in that area or arrange to carry out a work placement at their company, shadow them for a day or go into their place of work to interview them.

Activity 4: What might you be? - game

What will you be in the future? Explore how the things you enjoy link to jobs involving science and maths with this fun quiz. Allow our mystery visitor to take you through 'What can you be?' to find out where science and maths could take you in the future or even in a parallel universe...



Talk about:

- Do you already know what job you would like in the future?
- If you don't know, what type of activities are you doing to help you find out?
- Do you think this game is helpful?
- Did it open your eyes to some of the careers that might be suitable to you?
- Would you recommend it to your friends?
- Do you think it asks the right type of questions for it to pick your future career?
- Are there any questions you would want to add?
- Are there any questions you would remove?
- If you were to make your own game to help young people think about their future career what would it be? What would it look like? How would it work? How would you make sure that young people knew where to find it?

What might you be? - game: Organiser's notes

What do I do?

1. Go to the Future Morph website and have a look at the section 'What might you be? – game': <http://www.futuremorph.org/11-13/play/game-what-might-you-be/>
2. Allow the students to explore how the things that they enjoy can link to jobs involving science and maths with this fun quiz.
3. Let the students each answer the questions to find out what careers may match to their personal preferences.
4. Discuss with the students why each of the roles came up for them depending on the answers that they chose to submit.
5. Ask the students if there are any questions that they would want to add or remove.
6. Suggest to the students that they make their own game to help young people consider their future career and what would be appropriate for each individual. What would the game look like? How would it work? How would they make sure that young people knew where to find it?
7. As an add on, why not suggest to the students that they design their own character for a STEM career of the future.

Activity 5: Values game – who are you?

This values game takes the user through a set of cards representing different values to help them identify what is important to them. Sponsored by the Science Council but developed by WISE (Campaign for Women into Science, Eng and Construction) based on American research where African American students undertook activities to reaffirm their self-esteem, integrity and values before sitting examinations. This boosted self esteem and helped them perform better by overcoming the worries they had about conforming to stereotypes of underachieving.



Talk about:

- You may already know exactly which career path you would like to follow but does that match who you are? Before you can really think about what you might do with your future you need to know a bit about yourself and what is important to you.
- Did you already have an idea of the values that are important to you?
- If not, was your chosen value at the end a surprise or do you think it is a true match?
- Were you surprised by those values that you cut out almost immediately and without thinking?
- Compare your chosen value to those of your friends – are they similar?
- Have a class debate about values and why there is no right or wrong answer.
- Why do everyday values such as these have an effect on our careers?

Values game – who are you?: Organiser's notes

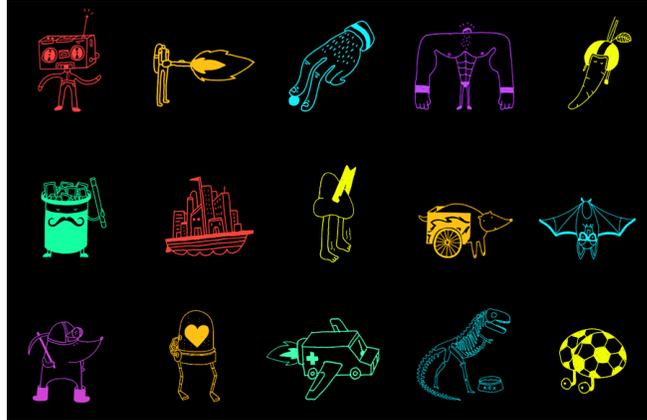
What do I do?

1. Go to the Future Morph website and have a look at the section 'Values game – who are you?': <http://www.futuremorph.org/11-13/play/values-game-who-are-you/>
2. Allow the students to each complete the values game to reach the end and find the value that is most important to them.
3. Ask the students to each state what their value is and why it is so important to them.
4. Discuss with the students why their values will have an effect and be useful in their future career.
5. Allow the students to discuss their answers with their friends to see if they would have said the same about them as they said about themselves.
6. Set a homework task for students to ask their friends, family and neighbours about the values that they each consider to be the most important to them. You could even set up a table (see below) to see if the students think that their career matches their chosen values.

Name	3 top values	Career	Match
Mum	World peace, Safety, Love	Secretary	✘
Dad	Wealth, Purpose, Family	Financial adviser	✓
Older brother	Fun, Fitness, Friendship	Personal trainer	✓
Next door neighbour	Adventure, Fame, Duty	Botanist	✘

Activity 6: My Future Finder

The future is up for grabs, where might you fit in? Use this section of the Future Morph website to explore jobs and careers with My Future Finder. This part of the site is split into 7 different themed areas including Leisure & Lifestyle; Health; Nature; Education & Communication; Entertainment & Culture; Business & Industry; and Society & Development so that students can explore their chosen area and then drill down for more detailed information on specific careers.



Talk about:

- Which theme would you consider looking at first?
- Are there any other themes that you would like to see covered here?
- Did you find any jobs within this section that you were interested in?
- Do you think it is a good idea to introduce young people to careers via interesting articles that are media-relevant?
- We are currently considering 8 new themes for this area including Medical Science, Disaster, Food, Water, Imagining Different Tomorrows, Sport, Fashion & textiles, Travel & tourism. Do you think these are good theme ideas or not?
- Consider creating a careers quiz for young people where all of the answers can be found in this section to get them thinking more about jobs within each of these areas.

My Future Finder: Organiser's notes

What do I do?

1. Go to the Future Morph website and have a look at the section 'My Future Finder' section: <http://www.futuremorph.org/my-future-finder/>
2. Allow the students to explore this area of the site and see if there are any careers that interest them and which theme these come into.
3. Use the quiz in Appendix 1 (or a version of it) to get the students to thoroughly explore the site or ask them to prepare their own quiz.

Activity 7: Future Morph poster

This poster has been produced to help raise awareness of the many and varied employment opportunities available from studying science and mathematics. The poster can be downloaded from Future Morph and displayed as it is or you can create your own poster by adding images to the blank template on the reverse side. Why not set it as a group task and encourage your students to use Future Morph to research potential roles? The images used on the poster have been kindly donated by a number of organisations who can offer support and information for schools. Why not visit their websites, to find out more about the people featured and the work of the organisations?



Talk about:

- Do any of the jobs shown on this poster interest you?
- Does it help you to think about the careers when there is a photograph?
- Are any of the people shown here not what you expected? (e.g. younger, female, fun-looking, etc).
- If you could choose to add a job to this poster to interest young people in a career in science and maths what would it be?

Future Morph poster: Organiser's notes

What do I do?

1. If you would like to download one of these Future Morph posters for your school you can do so here: http://www.futuremorph.org/wp-content/uploads/2012/03/FutureMorphPoster2010_Finalb.pdf
2. Allow the students to consider their own career in this way.
3. Suggest to the students that they create their own poster (perhaps using a communications theme) by adding images to the blank template on the reverse side. This could be a group, class or individual task to encourage young people to use Future Morph to research potential roles.

Activity 8: Future Morph questionnaire

As an additional activity, why not simply explore the Future Morph (www.futuremorph.org) website? There is so much material and resources on the site, set out in key sections for students in 3 different age groups (11-14 years, 14-16 years, and 16-19 years), as well as areas for their main influencers: parents, teachers and careers staff.

If you would like to set this as a classroom activity for half of the lesson to tie in with one of the earlier activities in this pack then why not use the questionnaire in Appendix 2 to keep the students focused and encourage them to get the most out of the site?

If you have any feedback on this questionnaire, or indeed any of the careers activities within this pack, please let us know at the following e-mail address:
futuremorph@sciencecouncil.org



Appendix 1: My Future Finder – Careers Quiz

Section 1: Leisure & Lifestyle

1. Q) Which fishes skin has the latest Olympic swimwear been made out of?
A) Shark.
[From article: 'Swimming like a shark.']

2. Q) Which job roles could you go into if you wanted to look at the health benefits of food?
A) Psychologist, neuroscientist, epidemiologist, dietitian, nurse, pharmacologist, food scientist.
[From article: 'Mums don't always know best.']

3. Q) Name the mobile phone company who has developed a wind-powered phone charger?
A) Orange.
[From article: 'The split personality of a phone.']

4. Q) What would you be if you worked in a food factory ensuring high standards are kept?
A) A quality control inspector.
[From article: 'When it's ok to put cans in microwaves.']

Section 2: Business & Industry

5. Q) What is the role of a nuclear engineer?
A) A nuclear engineer researches ways to make nuclear power more efficient with less waste.
[From article: 'Nuclear waste and pointing fingers.']

6. Q) Which major car manufacturers have developed machinery for self-parking cars?
A) BMW and Toyota.
[From article: 'A car that calls all the shots.']

7. Q) What is your role if you keep the public up to date with the latest news and events?
A) Public relations officer.
[From article: 'Turning wasteland into gold.']

8. Q) Can you list the professionals who will be involved in creating the Olympic Village?
A) Minerals surveyor, environmental health practitioner, engineering or land surveyors, architects, quality surveyors, civil and structural engineers, environmental psychologists, public relations officer, electricians, and network managers.
[From article: 'Turning wasteland into gold.']

Section 3: Education & Communication

9. Q) What is eye tracking?

A) A technology that enables disabled people to control their computers by blinking their eyes.

[From article: 'Technology never gives up.']

10. Q) What is spambot?

A) Software that searches for email addresses online.

[From article: 'When spam doesn't take the hint.']

11. Q) If you were a web designer specifically working against spam what would you do?

A) Design websites which don't allow people access to email addresses whilst still allowing people to easily contact the necessary people.

[From article: 'When spam doesn't take the hint.']

12. Q) How can you charge a mobile phone in rural Africa?

A) Solar power.

[From article: 'Mobile phones. They're finally here.']

Section 4: Entertainment & Culture

13. Q) What sort of technology is used by mathematicians when creating films?

A) Computer Generated Imagery.

[From article: 'Films. Apparently it's all about the boxes.']

14. Q) What do computer games designers actually do?

A) They look at which animations can be used in computer games in real time situations.

[From article: 'Films. Apparently it's all about the boxes.']

15. Q) What is the wingspan of the Angel of the North?

A) 54 metres across.

[From article: 'Art and science meet head on.']

16. Q) What is the role of a music industries promotion manager?

A) They promote their clients work and make sure their music can be accessed by as wide an audience as possible.

[From article: 'Putting music on the mic.']

Section 5: Health

17. Q) Who put Michael Owen back together after the 2006 World Cup?

A) Dr Richard Steadman.

[From article: 'Rebuilding Michael Owen.']

18. Q) What does a radiographer do?

A) A radiographer uses magnetic resonance imaging to produce cross-sectional images of the body to diagnose injury precisely.

[From article: 'Rebuilding Michael Owen.']

19. Q) What is the i-snake?

A) The i-Snake is a long tube, packed with complex motors, sensors and imaging tools. It can become the surgeon's eyes in places within the body that are usually tough to reach.

[From article: 'Snakes, surgery and 5 pence pieces.']

20. Q) What does a clinical cytogeneticist do?

A) They study chromosomes from samples of human blood, tissue, bone marrow or other bodily fluids to diagnose genetic diseases.

[From article: 'Cracking the whip on rogue genes.']

Section 6: Nature

21. Q) What does an aerospace engineer do?

A) They work on projects to develop spacecraft, deciding how big they should be, or what rockets to launch them on, whilst also ensuring technical specifications and requirements are met.

[From article: 'Space and time travel. The future & past is here.']

22. Q) What happened on Boxing Day 2004 that prevented many people from celebrating Christmas?

A) Earthquake off the west coast of Sumatra, Indonesia, which triggered a series of devastating tsunamis which hit most of the surrounding coasts.

[From article: 'Christmas is cancelled.']

23. Q) What is your job if you predict the effects on future weather systems?

A) A meteorologist.

[From article: 'Playing dominoes with the planet.']

24. Q) Where is global warming occurring 5 times faster than anywhere else in the world?

A) In the Antarctic.

[From article: 'Playing dominoes with the planet.']

Section 7: Society & Development

25. Q) What is the name of the signal used to identify what's happening to a material at the molecular level?

A) The Raman signal.

[From article: 'Fingerprints can't play hide and seek.']

26. Q) What are there millions of in the UK alone that are used to seek out crime?

A) Security/CCTV cameras.

[From article: 'When it's not rude to stare.']

27. Q) What is a tag cloud?

A) They are displays of words relating to a particular subject that can be coloured or sized differently depending on how many times they've been linked to that subject.

[From article: 'The government and mash-ups.']

28. Q) How many people in the world are lacking an adequate water supply?

A) Nearly 1 billion.

[From article: 'Someone know a good plumber?']

Appendix 2: Future Morph Questionnaire

1. What is your age range?

- Under 11 years
- 11-14 years
- 14-16 years
- 16-19 years
- Over 19 years

2. What is your favourite subject at school?.....

3. Do you like science?

- Yes
- No
- Sometimes
- Depends on the teacher

4. Do you like maths?

- Yes
- No
- Sometimes
- Depends on the teacher

5. Did Future Morph make you see either science or maths differently?

- Yes
- No

If so, how?.....

.....



6. Which sections of Future Morph did you visit first?

- 1).....
- 2).....
- 3).....

7. Did any of the jobs mentioned on the site interest you?

- Yes
- No

If yes, which ones?.....

.....

8.a) Were the jobs mentioned on Future Morph ones that you expected to be available from science?

- Yes
- No

b) Name any that surprised you.....

.....

c) Which did you already know existed?.....

.....

9. Before you visited Future Morph, did you know what job or career you wanted to do in the future?

- Yes
- No
- I had some idea

If yes, please tell us what it is here.....

10. Did Future Morph give you new ideas for jobs that you hadn't thought of before? (please circle the correct answer)



11. Prior to visiting the Future Morph site, how much careers advice had you received?



12. If you had previously received careers advice, how helpful was it?



13.a) Where would you normally go to get careers advice?



	✓	✗
School/teacher		
Parents		
Family		
Friends		
Internet		
Careers Centre		
Don't know		
Other		

13.b) Out of those that you would go to for advice, which would you be most likely to use?.....

.....

14. Did Future Morph help you to find out what skills you get from studying science and maths?

- Yes
- No

15. What is the best thing about Future Morph?.....

.....

16. What do you not like about Future Morph?.....

.....

17. How do you like the information to be displayed? (please rank in order of preference from 1 to 5, where 1 is the highest and 5 is the lowest)



Format	Rank
Career profiles	
Interactive games	
Articles	
Question and answers	
Text with some images	

18. Had you visited the Future Morph website before?.....Yes/No

19. Will you visit the Future Morph website again?.....Yes/No

20. Would you recommend Future Morph to your friends?.....Yes/No

If you would like to feedback any of your thoughts to Future Morph directly, please do so at the following e-mail address: futuremorph@sciencecouncil.org

Thank you for taking part in the



Careers Activity Pack!