# British Science Week 2016

## Level three quiz questions

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British Science Week 2016

# British Science Week quiz 2016

The British Science Association has been working with a variety of new organisations over the last year to broaden the definition of what science means and is about. To reflect this, we've got new categories that reflect some of the new areas we're exploring.

This quiz can be played in teams or individually, and is available in three levels. Level one is suitable for ages 5–8 and level two is suitable for ages 8–13+. Level three is designed to be a bit more challenging and is open to all. **This quiz sheet is level three.**

There are **five** rounds to the quiz:

**Round 1: Science and performing arts**
Questions set by Electric Voice Theatre

The BSA is an Artsmark supporter.
These questions are about the science of art and the art of science.

**Round 2: Science and history**
Questions set by Historical Association

Questions about the history of our scientific past that will also shape our future.

**Round 3: Science and dance**
Questions set by One Dance UK

What's dance got to do with science? – More than you may think.

**Round 4: Science and geography**
Questions set by Geographical Association

People, places, environments and the physical landscape.

**Round 5: Science and sport**
Questions set by Youth Sport Trust

Knowledge of the science behind sport is essential for the success of all athletes and sports people. Test your sports-science knowledge.


**Round one**
**Science and the performing arts**

Questions set by
Electric Voice Theatre

1. Mary Anning was one of the most famous and unusual Victorian women – what was she famous for?
   A. Mathematics
   B. Palaeontology
   C. Volcanology
   D. Botany

***Bonus question:*** Why was what Mary Anning did so unusual in Victorian Britain?

2. Lady Ada Lovelace was a 19th Century mathematician and daughter of the poet Lord Byron and wrote the first what?
   A. Machine algorithm (computer programme)
   B. Translation of Egyptian hieroglyphs
   C. Times tables
   D. Maths text book for schools

3. The Jaquard Loom, used to produce textiles (patterned cloth), inspired Charles Babbage to design the analytical machine and Ada Lovelace to create the first programme for it in the 1830's. The analytical machine would have been the first computer, but was never built. When was the first modern electronic computer built?
   A. 1840's
   B. 1890's
   C. 1940's
   D. 1980's

***Bonus question:*** A jacquard loom worked by using a card punched with holes to provide the instructions for the design to the loom. How is this similar to how a computer works and how music is played?

4. In 2015 Nicole Kidman starred as Rosalind Franklin in the play "Photograph 51" in London. Photo 51 was one of the most famous and important pictures of the 20th century and helped to work out the structure of the molecule of life. What is this molecule called?

***Bonus question**: What were the names of the two scientists who discovered the structure of this molecule? (Rosalind Franklin's x-ray photo 51 helped them to get to the answer much quicker).*

5. Composer Kate Whitley has composed some pieces for us to perform about the theories of quantum gravity and String Theory. We sing them acapella but if we could add instruments name five instruments which might help us perform ***String** Theory*?

***Bonus questions**: What does acapella mean?*

**Round two**
**Science and history**

Questions set by
Historical Association

1. Which new technology of the Industrial Revolution replaced water power?
   A. The steam engine
   B. First electrical capacitor
   C. Seed drill
   D. Gas lighting

**Bonus question:** Which fossil fuel started to be used a lot more during the Industrial Revolution?

2. What did Louis Pasteur discover? (there's a clue in the bonus question below)

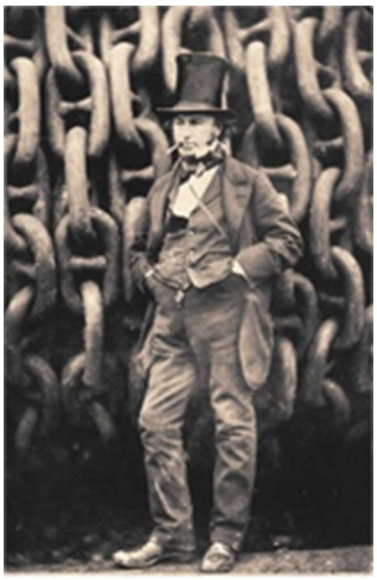
**Bonus question:** What type of microorganisms causes this disease?

   A. Virus
   B. Bacteria
   C. Fungus

3. If you visited a barber surgeon in the medieval period, what might you expect to receive?
   a. A haircut
   b. A shave
   c. A tooth extraction
   d. An amputation
   e. All of the above.

4. During World War II, Alan Turing was famous for cracking which code?

5. Who is this a picture of?



**Bonus question:** Name two famous things that he designed.

**Round three**
**Science and dance**

Questions set by
One Dance UK

1. When dancing, muscles contract to make the bones of the body move. What is the name of the special connective tissue that joins muscle fibres to the bones?

**Bonus question**: What is the name of the tough fibres that join bones together?

2. Dancing is very strenuous. When the body works hard it gets hot and starts to overheat. Name **two** ways that the body reacts to increasing body temperature to keep cool?

3. When a dancer exercises their heart and breathing rates increase. Why do the heart and lungs work faster when doing exercise? Think about what job each of these organs do.

4. When a ballet dancer performs a pointe (standing on their toes) the pressure on the floor increases. Use the information and formula below to calculate how much the pressure increases by:

Pressure (Pascals (Pa)) = force (Newtons (N)) ÷ area (metres (m))

Weight = 450N

Area of one foot flat on the ground = 0.18$m^2$

Area of one foot on tip toes = 0.0008$m^2$

5. Balance is very important to dancers. Which organ, other than eyes, plays a big part in helping a dancer, and you, to keep balance?

**Round four**
**Science and geography**

Questions set by
Geographical Association

1. What happens when warm and cold air meet? (Clue: it might make you feel down or sad.)

2. What two things happen when an ocean floor earthquake occurs to create a tsunami?

3. Why is the interior of Antarctica sometimes called a polar desert?
   a) It has snow dunes
   b) It is hot during the Antarctic summer
   c) It experiences the Antarctic summer
   d) It experiences low levels of precipitation

4. What product of a volcanic eruption beneath glacial ice caused air travel chaos in 2010?

**Bonus question:** In which country did this eruption take place?

**Double bonus:** Can you name the volcano?

5. What causes the west coast of the British Isles to have a relatively mild climate in winter?
   a) The Gulf Stream
   b) More hours of sunshine in the West of Britain
   c) The greenhouse effect

**Challenge question**

In what ways are 'fracking' and erosion resulting from the impact of waves on a coastal cliff similar?

**Round five**
**Science and sport**

Questions set by
Youth Sport Trust

1. At the 2012 London Olympics, Mo Farah won gold in the 10,000m and 5,000m. How many laps of the 400m track did he run in total to win both his finals?

2. Which of these food groups would be most useful to a marathon runner?
   a) Fats
   b) Carbohydrates
   c) Protein

3. Soft tissue injuries are common in sports performers. Can you match these muscles to the correct part of the body?

| | |
|---|---|
| 1. Quadriceps | a) Arm |
| 2. Triceps | b) Back |
| 3. Latissimus Dorsi | c) Leg |

4. In the world of sport; speed is king! Which do you think was faster – the fastest shot (free kick) recorded in a football game or the fastest cricket bowl recorded in a test match?

(a) Football

(b) Cricket

**Bonus question:** how fast, to the closest mile per hour, was the ball travelling?

**Double bonus:** which sportsman did this?

**Triple bonus:** what year did this happen in?

5. In a triathlon athletes have to swim, cycle and run to complete their race. For each section of the race can you name two different forces that they will have to work against?

**Bonus question**: can you suggest a piece of equipment that might help them to reduce resistance? You must state the method and how it reduces resistance.