

Advice on diet can come from many sources, such as books, TV, and on the internet. It sometimes comes from companies who want to sell eating plans and diet supplements. Only some of the advice can be trusted.

6. List the food types in order of the relative proportions we should include in our diet, as recommended by the 'eatwell' plate in Figure 1.2.2a.
7. Describe the evidence (if any) given in the adverts in Figure 1.2.2b and 1.2.2c for these diets improving health.
8. Should you believe adverts? What might you want to know before deciding whether or not to trust them?

Mediterranean diet, which includes whole grains, and fats from healthy sources, such as olive oil. It is believed by some that it is linked to good health and a lowered risk of heart disease.

We are sometimes told that fat in our diet is bad for us. Explain why this can be both true and false.

Explain why constipation is less common in Mediterranean countries than in most Western countries.

Healthy eating plans



eed different amounts of each of the food groups in a healthy diet – it would not be sensible, for example, to eat

4. The conclusion made in Table 1.2.3 about the food groups that chicken contains is incomplete. Name the other food group that it contains.
5. Describe the observations that the scientists would have made when testing chickpeas.
6. Predict the observations that the scientists would make if they tested milk.

Some food labels show the amount of energy that the food contains. These labels help people to know the amount of energy they are taking in. However, we should also take into account other factors when choosing which foods to eat, such as the nutrients and the amounts of salt and fat they contain.

7. Looking at just the energy counts shown in Figure 1.2.4c, suggest why some people would find it difficult to choose between having butter or jam for breakfast, or between having chocolate or a banana for a snack.
8. Think back to what you have learned about nutrients in food. Which of the choices in question 7 would be the healthier? Explain why.
9. Calculate how many bananas an average adult male should eat to obtain the energy he requires if he ate nothing else for the whole day. What would your advice be to this man about eating in this way?

Nutrition Facts

Nutrition Facts

loss, muscle loss, dry skin and hair, infertility and fatigue. Both obesity and starvation can cause death.

- 1. What is meant by 'BMI'?**
- 2. What causes starvation?**
- 3. Draw a table to summarise the physical effects of obesity and starvation.**

Scientists try to monitor the causes of death of people around the world. The graph in Figure 1.2.5d shows an estimate of the number of deaths caused by obesity and starvation in 1990, 2000 and 2010.

5. Describe the trend in the number of deaths between 1990 and 2010 caused by:
 - a) obesity
 - b) starvation
6. Compare the number of deaths from obesity and starvation in 2010.
7. Suggest why it is difficult to gain accurate numbers for the deaths caused by obesity and starvation.

nutrients lead to permanent damage which is needed to allow growth. This is caused by a lack of vitamin D, which strengthens them and allow your body to use vitamin D. It is needed to allow your body to use vitamin D.

Q. In the past, why did a lot of sailors suffer from scurvy?

1. In the past, why did a lot of sailors suffer from scurvy?
2. Suggest why children need more calcium than adults.
3. In recent years, children living in developed countries have spent more time indoors. Why there has been a rise in rickets in recent years?

Preventing and treating deficiency diseases

Deficiency diseases are usually easily treated by introducing the missing nutrient into the diet. The problem in the past has been identifying the cause. This is treated by eating fruit and vegetables.

iration.

Describe how digested food molecules are carried around the body.

Complete the sentence by choosing the correct word in brackets.

The walls of the small intestine must be (thin / thick) and have a (rich / poor) blood supply.

'The digestive system and the circulatory system are linked.' Discuss this statement. Use the word respiration in your answer.

- . Which of the students described some evidence that physical digestion had taken place?
- . Which of the students described some evidence that chemical digestion had taken place?
- . One student found out from the internet that starch molecules are broken down into glucose (sugar) molecules. Does this support the student with evidence that digestion starts in the mouth?

the large intestine. The remaining waste is held in the rectum by a muscle, before we release it through the anus and into the toilet. This waste is called faeces. There are some foods we cannot digest, such as corn.

4. Where are faeces held before passing through the anus?
5. How could you tell that humans can't digest corn?
6. If the large intestine does not function properly, water is not completely absorbed. What condition could this lead to?

Adaptations of the organs



Each of the organs involved in digestion is specially designed for the job it does. This is known as an adaptation. For example, the mouth is well developed to chemically digest food.

7. Describe what happened to the starch inside the tubing.
8. In the model, what was represented by the:
 - a) visking tubing?
 - b) starch inside the visking tubing?
 - c) water surrounding the visking tubing?
9. Explain why glucose passed through the visking tubing but the starch did not.

4. Describe what would happen if protein was mixed with amylase. Explain your answer.
5. Explain why we need enzymes to act as 'chemical scissors' during digestion.
6. Sufferers of cystic fibrosis release very few enzymes into the small intestine. What are the consequences of this?

understanding of forces and are still very important today. In recognition of his work, the unit of measurement of force is called the **newton** (N). Instruments called **newtonmeters** are used to measure force.



FIGURE 1.5.3a: Sir Isaac New
(1643–1727)

1. What is the unit of measurement for force?
2. What is the correct abbreviation for the unit of force?
3. What instrument is used to measure force?

Measuring with precision

Newtonmeters come in different models for measuring different-sized forces. In Figure 1.5.3b, one of the newtonmeters can measure force to a greater degree of precision than the other one, but it can... .

FIGURE 1.5.3C: Using a balance to find the mass of an object

6. Why do you think that some people confuse weight and mass?
7. If you measured the mass and the weight of an object on two planets of different sizes, what differences would you notice? Explain your answer.
8. Imagine a car crash on the Moon and the same crash on Earth. There would probably be no difference in the damage between the two crashes. Explain why this is the case.

3. A spring is being tested. It stretches by 3 cm when a force of 10N is applied to it. If it behaves according to Hooke's Law, how far would you expect it to extend when these forces are put on it?

- a)** 20 N
- b)** 70 N
- c)** 2 N

4. State Hooke's Law in your own words.

Look at Figure 1.5.7d. Describe what happens as the force on the spring is increased.

From the graph:

a) how much force is needed to extend the spring by 7 cm?

b) how much does the spring extend by if a force of 3.5 N is applied to it?

1. a) Suggest approximately what size of force is needed to exceed the elastic limit of the spring.

b) Why is it not possible to be sure what the exact limit is from the graph?

The friction is between the bottom surface of the object and the top of the road/track.

Pushing force is greater than the friction.

Pushing force is equal to the friction.

The engine has to produce enough force to overcome friction.

4. Draw a diagram with labels to explain how friction occurs between two surfaces.

5. Draw an outline of a car in the middle of a sheet of paper. Around the outside add labels to identify where friction could occur. Add details to the diagram to make your descriptions clear.

6. Suggest some problems that friction could cause in a machine - for example a car or a bicycle.