SUPER CELLS

Cellular Respiration

Watch the video here: https://youtu.be/yQwZ58AOndE

Swansea University
Science for
Schools Scheme

CELLULAR RESPIRATION

MOVING ENERGY

The Activity

✔

I did it!

Materials

- 2x Cups
- Empty plastic tub
- Stopwatch or timer
- Some different types of food

Burning off calories:

1. Do some exercise for one minute. Use a timer or stopwatch to measure one minute. If you are doing star jumps, you should count how many you do.
2. Use our exercise guides work out how many calories you burned in one minute. You can choose to get these calories back as food. Use our food energy guides to work out how much of each food you could eat.
3. Try switching to a different exercise or activity and repeat this.

The cup blowing game:

Our bodies convert stored energy from our food into kinetic and heat energy. Try our game to convert energy from your body into kinetic energy.

1. Put an empty tub in the middle of a table.
2. Stack the two cups (one inside the other) and place them on the table directly in front of you, with the open side facing up.
3. Blow downwards on the stacked cups, aiming at the gap between the rims of the two cups.
4. Blow sharply so that the top cup 'jumps' out of the bottom cup.
5. Try and aim your blows so that the top cup lands in the tub in the middle of the table. If you miss, try again.

Watch how to do it here.

Food and exercise guides

Choose a food type from the drop-down list to find out how much energy it contains.

In **1 carrot stick** there is/are **1** calorie/calories.

Choose a type of exercise from the drop-down list to find out how much energy it uses.

2.0 minute(s) of **dancing** uses **12.0** calories*.

0 star jumps use **0** calories.

I used **12.00** calories by doing exercise.

I am going to replace this by eating **carrot sticks**

I can eat **12.00** of this food type.

* These numbers are just a guide. They will be different for each person.

EXERCISE

ACTIVITY SHEET

Draw or write below what happens to your body when you exercise.

Key words to think about: heart, pulse, sweat, breathing, blood, muscles.

When I exercise, the cells in my muscles need more oxygen so they can produce energy to move. My breathing gets faster to get more oxygen into my body. The oxygen is transported from my lungs to my muscles by my blood cells. My heart pumps faster, which pumps blood around my body faster, so my muscles can get more oxygen. This makes my pulse feel faster and stronger. When the cells in my muscles produce kinetic (movement) energy, they also produce heat energy, so my body gets warmer. I my body produces sweat to cool itself down.

Tick the sentences which you think are true.

The number of calories in food tells us how much energy it will give our bodies.	✔
When we exercise, our pulse gets slower.	☐
Our cells turn sugar into energy. This is called respiration.	✔
If we eat more calories than we burn off, the extra energy is stored as muscle.	☐
Our bodies get energy from the food we eat.	✔
We burn more calories watching TV on the sofa than when we exercise.	☐
Our cells turn sunlight into energy.	☐
In respiration, our cells take in oxygen and give off carbon dioxide.	✔

Put these activities in order of how much energy they use up (number them 1 to 5)

Sleeping	1
Running really fast	5
Jogging slowly	4
Walking	3
Sitting and watching TV	2

THE EXPERIMENT

You are going to do some exercise to burn off calories. You should take this energy back as food.

Draw or write below what exercise you did and how long you did it for:

E.g. I danced for 2 minutes.

How much energy did you use up (in calories)?

I used up 12 calories.

How much food is this the same as?

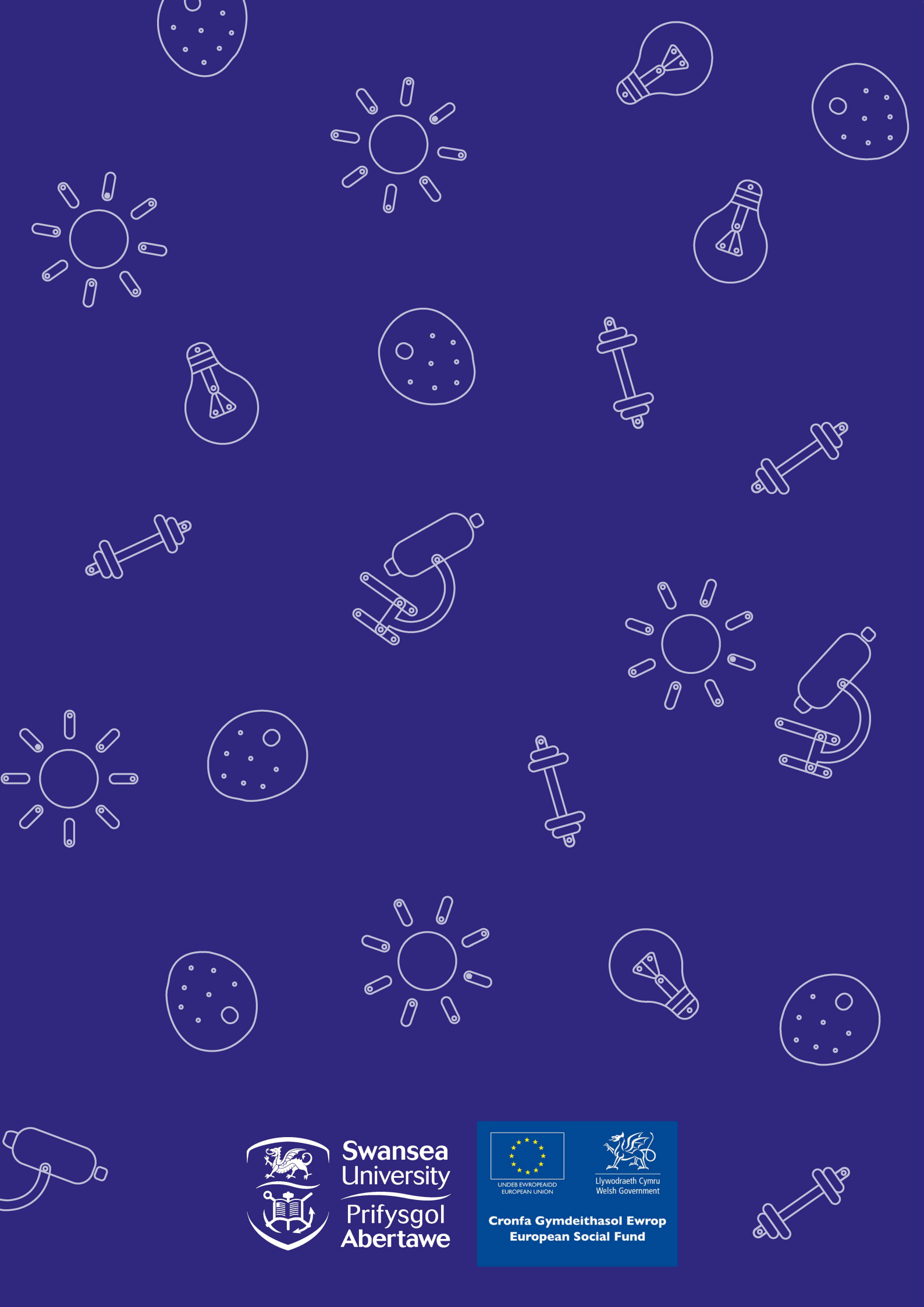
As fruit 6 grapes

As chocolate/ sweets 3 chocolate buttons

What do you think this means?

chocolate contains more sugar than fruit, so it has more calories. This means it gives our bodies more energy.

Notes:



Swansea University
Prifysgol Abertawe

UNDEB EWROPEAIDD
EUROPEAN UNION

Llywodraeth Cymru
Welsh Government

Cronfa Gymdeithasol Ewrop
European Social Fund