ACET Junior Academies'

Scheme of Work for Science

Big Idea – Living Things

Year 6 – Nutrition and transport

About this unit:
PoS – Animals, including humans
This is a short unit, given the timing for Y6. It builds on the earlier unit – 'Health and humans', where we looked at the systems in the body, and in particular the circulatory system and how it works with the muscles. We also looked at lifestyle, health and smoking. In this unit we will build on what we learnt, adding in information about the digestive system, looking at the role of the kidneys in filtering the blood, and considering the effects of alcohol.

There are PSHE links with teaching about alcohol – teachers will be able to choose appropriate activities from those provided by drinkaware or elsewhere.

Unit structure
This unit is structured around four science enquiries:

1. What is a diet?
2. How does the digestive system work?
3. What do our kidneys do?
4. Are all drinks the same?

Links to previous and future National Curriculum units
PSHE
Y3 – nutrition, skeleton & muscles
Y6 – Health & humans

- KS3&4 Biology

<table>
<tr><th colspan="4">Enquiry 1: What is a diet?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="2">Y3 – nutrition, skeleton & muscles
Y6 – health & humans</td><td>EA – Research

Asking questions
Making predictions</td><td rowspan="2">Can your children:
- Define ‘diet’
- Describe what a balanced diet means in terms of the eatwell guide.</td><td rowspan="2">Horizontal:
History

Vertical:
KS3&4 Biology</td></tr>
<tr><td>Key concepts:
Your ‘diet’ is what, and how much, you normally eat.
We need a balanced diet, containing the proportions found in the eatwell guide.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Diet, balanced, fruit & vegetables, starchy carbohydrates, dairy, alternatives, protein, oils & spreads</td><td colspan="2">‘Diet’ is often linked with ‘trying to lose weight’ rather than ‘what you eat’</td></tr>
<tr><th colspan="2">Suggested activities</th><th>Resources</th><th>Useful links</th></tr>
<tr><td colspan="2">What have you eaten during the last 24 hours? What do you typically eat during the week?

What does the Government tell us we should eat?
Use the eatwell guide rather than the eatwell plate.

Compare your diet to what a child might have eaten in WW2 (or the Mayans, or any other group that live differently to us).

Were/are they unhealthier or healthier than you? Is it just the food that has an impact on this?</td><td></td><td>https://www.nhs.uk/live-well/eat-well/the-eatwell-guide/</td></tr>
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<table>
<tr><th colspan="4">Enquiry 2: How does the digestive system work?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td>Y3 – Nutrition, skeleton & muscles</td><td>EA – Identifying, grouping & classifying

Asking questions
Observing

Key concepts:
The purpose of the digestive system is to get the food to go in to the blood, so it can be delivered around the body.
Poo is made from undigested food – parts of food that are too large to be carried by the blood.</td><td>Can your children:
- Tell you what the purpose of the digestive system is
- Describe what undigested food is, and what happens to it</td><td>Horizontal:

Vertical:
KS3&4 Biology</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Diet, balanced, fruit & vegetables, starchy carbohydrates, dairy, alternatives, protein, oils & spreads, digest, break down, small, transport, carry, large, undigested,</td><td colspan="2">Students often don't realise that our blood absorbs any parts of food which are small enough for it to carry. It does NOT differentiate between 'good' and 'bad' food. Poo is just the larger parts of food which the blood did not pick up. It's yucky because your body has added more waste to it as it goes through your digestive system.</td></tr>
<tr><th>Suggested activities</th><th>Resources</th><th colspan="2">Useful links</th></tr>
<tr><td>Good opportunity for an 'Explanation Text'

Draw a life sized outline of a student. What are the organs of the digestive system? Where do they go? Greater depth – the alimentary canal is one continuous tube, with some supplementary organs like the liver and pancreas.

The purpose of the digestive system is to get the food to go in to the blood. It gets broken down by chemicals all the way down, and in the small intestine, small particles of food get passed in to the blood.

Greater depth – evaluate how good the model is as a representation of a real digestive system.

Scaffold – write down the important steps of what happens in the model, and compare with what happens in the digestive system. Write a story about 'being a cheese sandwich'. What happens to you at each step? GD can consider the proportions of different types of food – they could 'be' the bread, and consider how much bread there is compared to cheese,</td><td></td><td colspan="2">https://www.bbc.co.uk/bitesize/topics/z27kng8 - Outline of the digestive system

https://www.youtube.com/watch?v=7av19YhNkhE - Modelling the digestive system. I would break up the cracker and banana first to show what the teeth do. Weetabix works well with this – you could make a 'breakfast'. Don't use orange juice to represent the acid, as it looks like that is mostly what is 'absorbed'. Use a few cm^3 of water in a container labelled 'stomach acid'.

https://nanopdf.com/download/the-journey-of-the-cheese-sandwich_pdf
Example of a cheese sandwich narrative – KS3, so it contains reference to enzymes etc which is not needed at KS2. GD students could consider the different proportions of food types.</td></tr>
</table>

etc, and mention that there should be some salad or fruit juice to accompany them.			
Enquiry 3: What do our kidneys do?			
Links to previous learning	**Scientific skills**	**Assessment criteria**	**Curricular links**
Y3 – Nutrition, skeleton & muscles	EA - Research **Asking questions** **Key concepts:** Water is absorbed into the blood, and delivered around the body. The kidneys filter the blood, and take waste and spare water to the bladder to be excreted.	**Can your children:** - State that water is transported around the body in the blood - Tell you what the kidneys do *GD – discuss capacity and quantities*	**Horizontal:** Maths – rates & volumes **Vertical:** KS3&4 Biology
Key terms		**Common misconceptions**	
Water, excretion, waste, filter, clean, absorbed, bladder, urine		*Misconception – students find it hard to understand that water is transported in the blood, rather than directly in & out of the digestive system*.	
Suggested activities		**Resources**	**Useful links**
How important is water in our bodies? Link back to the circulatory system Look at the systems in the body – you drink water, so it goes into your digestive system, but it comes out of your urinary system, which is entirely separate! How does that happen? See key concepts. Kidneys – cool facts about the kidneys Dissect a kidney – try and identify different parts. Use a hand lens. What animal is your kidney from? How big is it in relation to the animal? How big do you think your kidney is? Make a presentation – Cool facts about the kidneys. *GD – link to other systems, and think about the implications. E.g. 'our kidneys filter 180 litres of blood a day. Or ALL our blood is filtered 3 times a day' – what does that tell you about how much blood we have?* Lots of opportunity for maths applications – rate of filtration, volumes of blood.		Kidneys & equipment for dissection	https://www.youtube.com/watch?v=k-E9kB4j38U Importance of water https://www.youtube.com/watch?v=rgcfdRra198 Dissecting a sheeps kidney - watch from about 1 minute to see how to dissect it. http://www.cyh.com/HealthTopics/HealthTopicDetailsKids.aspx?p=335&np=152&id=2409 https://www.kidneycareuk.org/news-and-campaigns/facts-and-stats/

<table>
<tr><th colspan="4">Enquiry 4: Are all drinks the same?</th></tr>
<tr><th>Links to previous learning</th><th>Scientific skills</th><th>Assessment criteria</th><th>Curricular links</th></tr>
<tr><td rowspan="2">Y6 – Health & humans
- smoking</td><td>EA – Identifying, grouping & classifying

Asking questions
Making predictions</td><td rowspan="2">Can your children:
- Tell you what alcohol is
- Describe how alcohol can be damaging to the body</td><td rowspan="2">Horizontal:
PSHE
Maths – estimating and measuring

Vertical:
KS3 & 4 Biology</td></tr>
<tr><td>Key concepts:
Alcohol is a chemical found in some drinks, which affects your brain and the rest of the nervous system.
A consideration of how alcohol can be damaging to the body.</td></tr>
<tr><th colspan="2">Key terms</th><th colspan="2">Common misconceptions</th></tr>
<tr><td colspan="2">Alcohol, drink, brain, nervous system, response, reaction time, slow, addictive</td><td colspan="2">Students often don't realise that alcohol slows down the nervous system – one of the most significant effects is to slow down reaction times.</td></tr>
<tr><th>Suggested activities</th><th>Resources</th><th colspan="2">Useful links</th></tr>
<tr><td>The effects of alcohol – the brain is part of the 'nervous system', which controls how we respond to things. Alcohol affects our nervous system and slows down our reactions.

Link to previous lesson, and the importance of water. Link also to the 'health & humans' unit, where we looked at lifestyle, the effects of smoking, and Government guidelines.

See links for resources on alcohol. Choose from the range according to PHSE needs and suitability for students.

This can be a good lesson to review volumes, measuring and estimating. Can the students estimate how much 25ml is? 50ml? What about other measures? Students can estimate how much they would be, then practising measuring precisely.
They could also convert between ml, L and pints.</td><td>Different glasses/measures
Equipment for measuring volumes of liquid.</td><td colspan="2">https://resources.drinkaware.co.uk/search?type=product&q=primary%20resources*</td></tr>
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