KS4 Super Curriculum w/c 4th May

Undercover Maths!

MATHEMATICS IN THE REAL WORLD

“Without mathematics, there’s nothing you can do. Everything around you is mathematics. Everything around you is numbers.”

Shakuntala Devi, Indian writer and mathematician

You are often told by your teachers and your parents that mathematics underpins everything we see and do in the world, so its important to work hard and make sure you get decent grades in the subject. But have you ever stopped to think more deeply about that Maths that goes into the little things you enjoy most every day? How the diameter of a football affects the amount of spin and curl you can generate when you kick it, for example? Or how the spiral patterns of seeds on a beautiful sunflower are vital to maximising its surface area, and hence its chances of reproduction?

This week’s Super Curriculum theme is “Mathematics in the real world”. You will get the opportunity to explore some of the mathematics in both sport and nature and then show us your creative skills as part of this week’s competition.

The mathematics behind competitive cycling

Many people are using cycling as a way of getting their daily exercise during the coronavirus pandemic. The following activities will allow you to deepen your understanding of the mathematics behind competitive cycling.

Nutrition and Cycling activity: https://nrich.maths.org/7571

The Fastest Cyclist activity: https://nrich.maths.org/8078

The information on the cards can be printed or viewed on a tablet or laptop screen to allow you to solve the problems. You'll need to use many of the skills you've learnt in your Maths GCSE, along with a bit of initiative!

COMPETITION TIME!

- Prize available for 1st place
- Honourable mentions for 2nd and 3rd place

Your task

Taking inspiration from what you have seen already, your task is to create a short video, or voice over powerpoint (maximum 5 minutes) that explains the real life mathematics in a subject of your choice. You can choose a subject from one of the following categories:

- Mathematics in Sport
- Mathematics in Nature

To see some ideas and get a taste of what we're looking for, please view the video links on the next page.

Some inspiration / ideas from other students:

The mathematics behind rowing formations:
https://www.youtube.com/watch?time_continue=4&v=IYxTaJpWzUo&feature=emb_logo

Projectile motion of a football:
https://www.youtube.com/watch?v=YJ01jojqyCw&list=PLTN2bMPwDm8bpVq9-wwgitStfPAXAIrUG&index=4&t=0s

Speed calculations in swimming:
https://www.youtube.com/watch?v=kXR9TXkic8Y&list=PLTN2bMPwDm8bpVq9-wwgitStfPAXAIrUG&index=5

Fractal patterns in the lungs:
https://www.youtube.com/watch?v=bReUlD8xNlw&feature=emb_logo

The Golden Ratio in nature (This is the topic you've already seen. Feel free to use it if you like!):
https://www.youtube.com/watch?time_continue=1&v=leoPU7321BM&feature=emb_logo

The geometry of beehives:
https://www.youtube.com/watch?v=5NmCuNapbXg&list=PLTN2bMPwDm8af1Bw7aZXwWYLIbSg4jrtv&index=5&t=0s

In your video, you should include:

- The specific branch of sport or nature you are looking at
- The mathematics that is involved, and why it is important
- Some examples of calculations that might take place, either by humans or naturally
- As much interesting and relevant information as you can find!

Above all, your video should be creative and informative, hopefully inspiring a love of mathematics in others.

In the video examples, the students worked in teams. In the current circumstances this might not be possible…but by all means try and collaborate with a friend using technology from home!

Please send or share all entries to competitions@gordons.school. Please use the subject heading "KS4 Week 2 – Undercover Maths".

The closing date for entries is Friday 19th June.

Judging will be done by the Maths department. We will not only be looking at the mathematics incorporated in your video, but also the level of creativity and originality used.

If you would like to discuss your idea for the competition, or would like a bit more information, please contact Mr Eaden via email at meaden@gordons.school.

Some tips for creating videos, along with recommended apps, can be found on the next two pages. If you would like any more guidance on these, please contact Mr Watts at pwatts@gordons.school.

Good luck!

Once you have taken your photos & videos, here's how you can create your own film:

Using a Mac, iPhone or iPad:

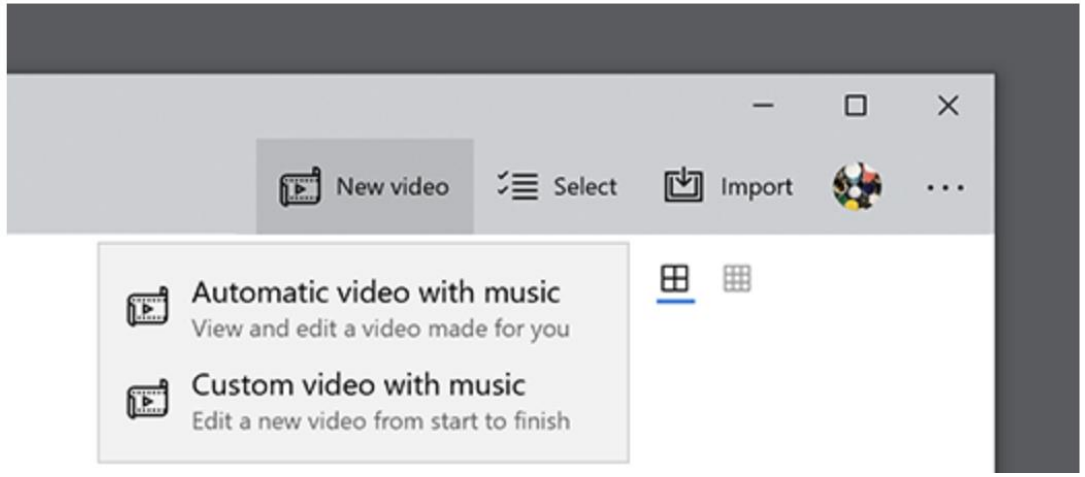
iMovie

- This is free software for Apple devices that can be downloaded from the App Store if it isn't already installed.
- There are plenty of guides to using this software on YouTube, including this one: https://www.youtube.com/watch?v=zR5USClbQZw

Using Windows 10:

Use the video editor in the Photos app to create video slideshows that combine your photos and videos with music, motion, text, and more. You can even add animated 3D effects, like sparkles or fireworks!

To get started, open **Photos** and select **New video** > **Automatic video with music** or **Custom video with music**.



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Online Video Editors:

Adobe Spark: https://spark.adobe.com/make/video-maker/

Clideo: https://clideo.com/video-maker

Biteable: https://biteable.com/tools/