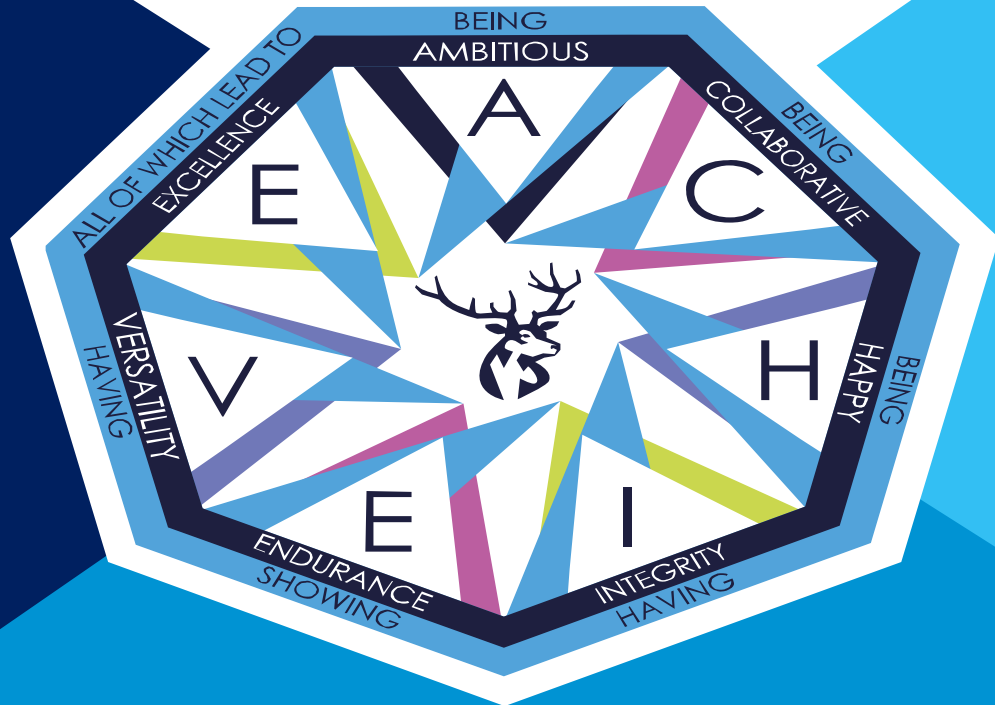


**FURZE  
PLATT**  
SENIOR SCHOOL



You will need:

- Pen
- Paper
- Calculator



# SIXTH FORM TASTER DAY - PHYSICS

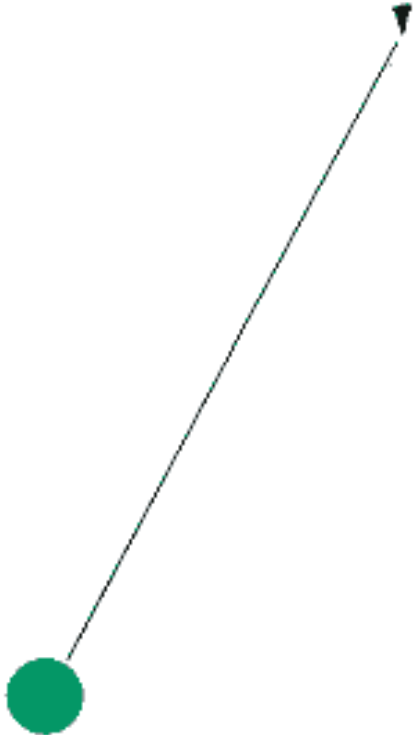
Mr Curnow / Mr Wright

June 2026

# A-level Physics Taster lesson

Discuss with the person next to you:

1. Name as many situations/ objects that use a pendulum as possible.
2. What factors might affect the time period of one swing of the pendulum?



# A-level Physics - introduction

What it is NOT...

- Boring
- Impossibly difficult

What it IS...

- Challenging
- Related to real life
- Respected on all university applications

**Mr Dartnell**

**Mr Mahar**

**Mr Wright**

**Mr Curnow**

**(Head of Physics)**

# Course Content



## Year 12

- 1 Measurements and practical skills
- 2 Particles and radiation – **X-rays**
- 3 Waves – **quantum theory**
- 4 Mechanics and materials - **projectiles**
- 5 Electricity – **sensors**

## Year 13

- 6 Further mechanics and thermal physics  
– **thermodynamics**
- 7 Fields and their consequences  
- **satellites and orbits**
- 8 Nuclear physics –  **$E = mc^2$**

## Options:

- 9 Astrophysics – **stars, Big Bang, Hubble's law**
- 10 Medical physics – **X-rays, MRI scanners**
- 11 Engineering physics – **structures and materials**
- 12 Turning points in physics – **special relativity**
- 13 Electronics – **digital / analogue amplifiers**

## A-level

### Assessments

Paper 3	
	<p><b>What's assessed</b></p> <p>Section A Compulsory section: Practical skills and data analysis</p> <p>Section B: Students enter for <b>one</b> of sections 9, 10, 11, 12 or 13</p>
Paper 1	<p><b>Assessed</b></p> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 80 marks</li><li>• 32% of A-level</li></ul>
<p><b>What's assessed</b></p> <p>Sections 1 to 5 and 6.1 (Pe</p>	
<p><b>Assessed</b></p> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 85 marks</li><li>• 34% of A-level</li></ul>	<p><b>Questions</b></p> <p>45 marks of short and long answer questions on practical experiments and data analysis.</p> <p>35 marks of short and long answer questions on optional topic.</p>
<p><b>Questions</b></p> <p>60 marks of short and long answer questions and 2 questions on content.</p>	<p><b>Assessed</b></p> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 85 marks</li><li>• 34% of A-level</li></ul>
	<p><b>Questions</b></p> <p>60 marks of short and long answer questions and 25 multiple choice questions on content.</p>

# Support

- Resources
  - Text books
    - either £35 from the science department
    - Loan second-hand copy
    - Use only version (free)
  - Revision guides available
  - Past paper and revision packs
- Physics Clinic (Weds 3.20-4.10)
- Availability – email!

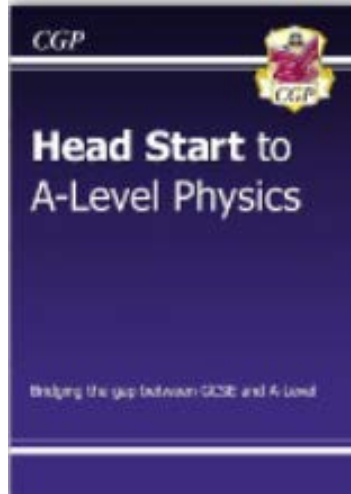
# How to succeed at A-level Physics

- Complete set work and home learning ahead of time
- Wider reading (see handbook)
- Consolidate notes, revise before and after lessons
- Textbook summary questions after each lesson
- Practice past paper questions prior to exam
- Problem solving: Isaac Physics, Olympiad...
- **Be curious about Physics!**

You should be aiming for at least 2 hours outside lesson for every 1 hour of lesson time

# Holiday homework...

Any issues at all, email:  
[huw.curnow@furzeplatt.net](mailto:huw.curnow@furzeplatt.net)

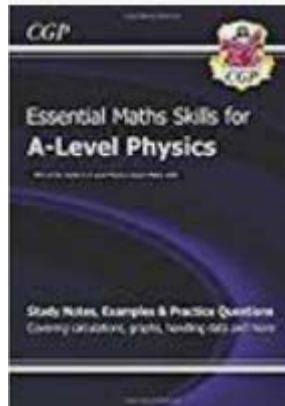


## “Head Start to A-level Physics” book:

- make notes on each page
- complete questions on lined paper
- mark & correct using answers at the back

## Physics Handbook:

- Read through the book, YouTube, and website recommendations, access as much as you can over the summer
- Then read through and complete questions on standard form and other practical skills



These are the hardest parts of the GCSE course, and give you practice at all the skills required of an A-level Physicist!

**\*Introductory test (first week back) will be based on this content\***

# CERN 2027? Geneva, Switzerland

- CERN tour + experience
- United Nations (?)
- Museums
- Other cultural stuff



# CERN 2027? Geneva, Switzerland

- CERN tour + experience
- United Nations (?)
- Museums
- Other cultural stuff

I'm at the early stages of planning the Physics trip to see CERN and Geneva next year

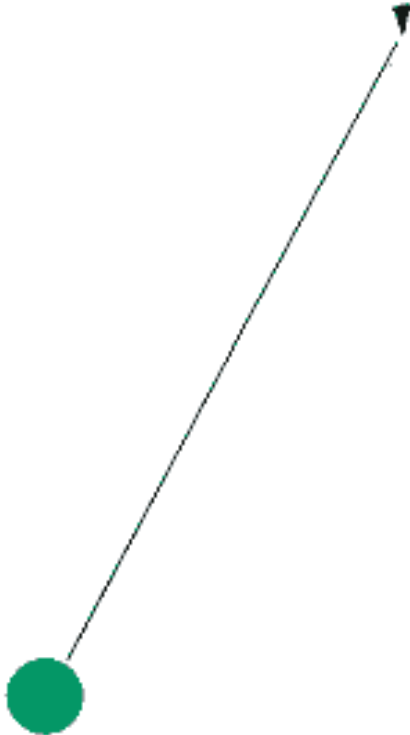
- The visit would take Friday-Sunday during term time in Feb/March
- Would involve travelling to an airport early Friday morning
- Cost likely to be around £550
- Please use the code to complete form →
  - This is not a sign-up list, it's just for me to have a rough ideas of numbers I should book for



# A-level Physics Taster lesson

Discuss with the person next to you:

1. Name as many situations/objects that use a pendulum as possible.
2. What factors might affect the time period of one swing of the pendulum?





What do all these...



...have in common?



# Time period of a pendulum

Pendulums have been used as timing devices for centuries.

What do you think might affect the *time period* (time taken for one swing)?

- Length of pendulum?
- Initial speed?
- Size/Mass of pendulum?
- Amplitude of swing?

Today *you* are going to find out..



# To investigate pendulums and relate their use to the real world.

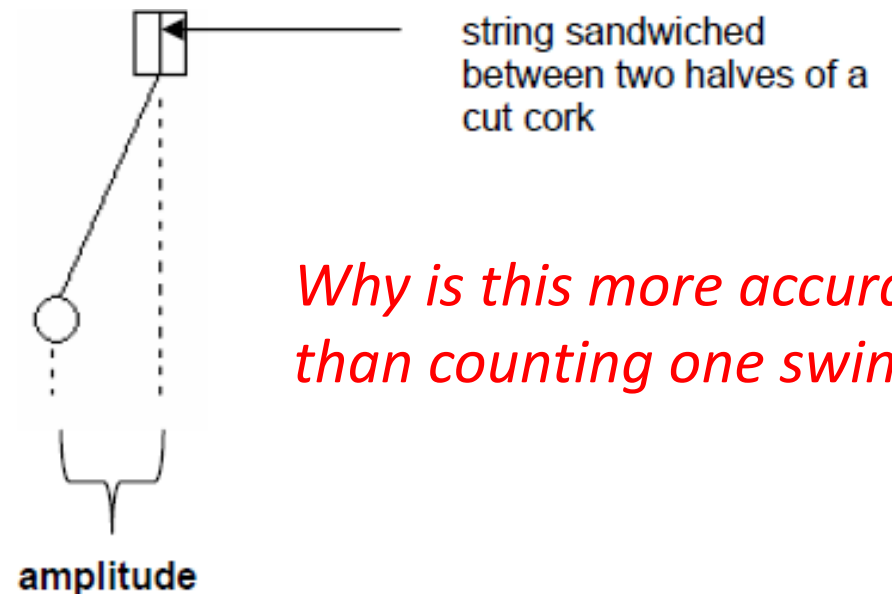
## Aims

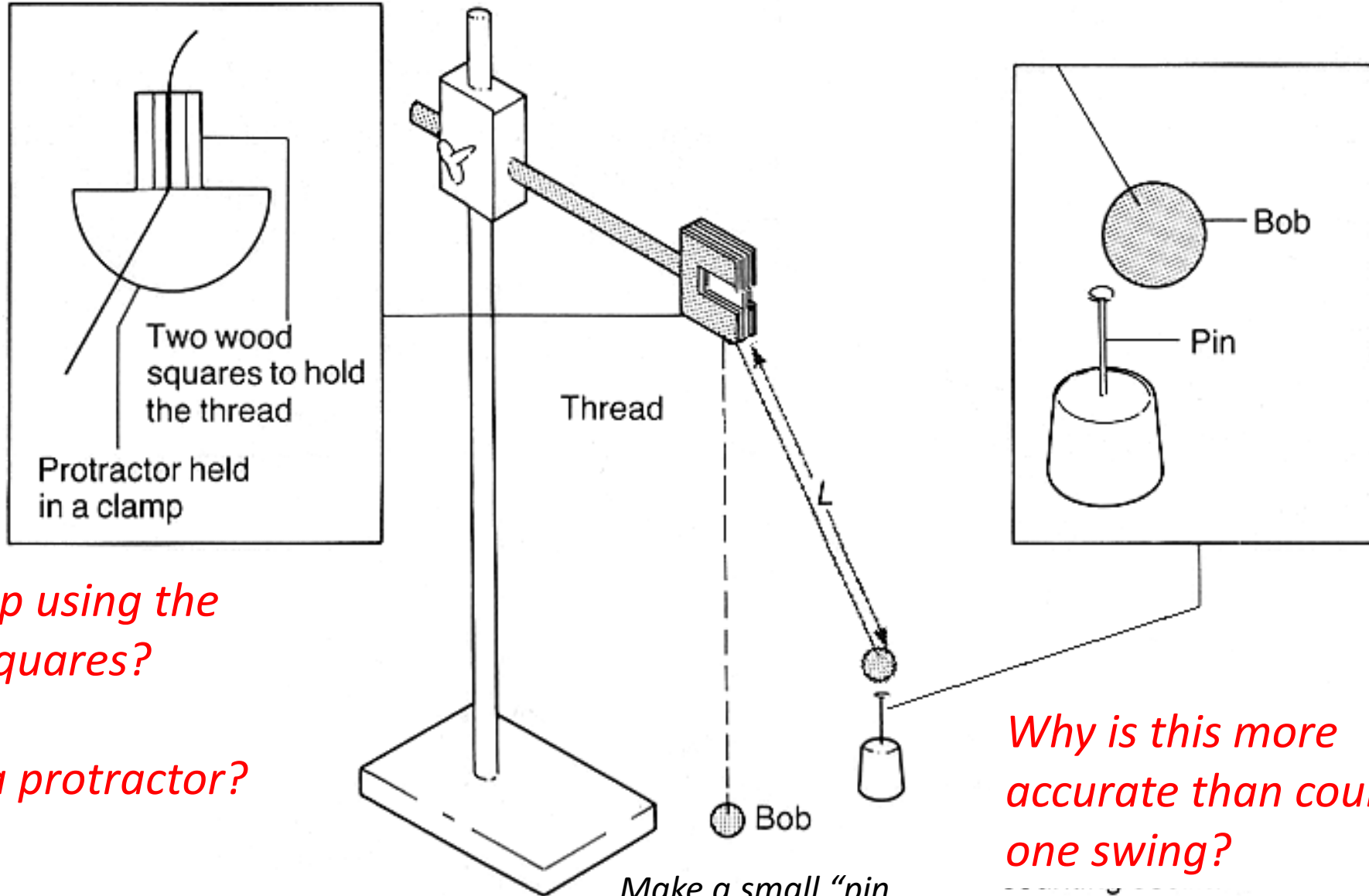
1. To investigate which factors affect the period of a simple pendulum
2. To measure the time period of a pendulum and use it to find "g"

## Method

- Construct a simple pendulum by tying the pendulum bob to the end of a piece of string.
- Sandwich the end of the string between two halves of a cut cork and clamp the pendulum with a clamp attached to a stand.
- Make sure that the stand is G-clamped to the bench so that it does not topple over.

- The **time period** is the time taken for one complete swing – from the pendulum to pass the same point twice
- The most **accurate** way to measure the time period is to measure for 10 swings, then divide by 10
- The **amplitude** is the maximum displacement from the vertical.





*Why clamp using the wooden squares?*

*Why use a protractor?*

*Why is this more accurate than counting one swing?*

*Make a small "pin shape" out of blue tack*

# Investigation pt 1: What affects the time period of a simple pendulum? Choose your experiment

## Experiment 1: Changing the amplitude

- Pull the pendulum bob to one side and let go.
- Count 10 complete swings past the pin marker, and stop the watch
- Record this time, and then divide it by 10 to find the time period.
- *Repeat with the pendulum bob released from different angles, and record your results*

### **Evaluation questions 1**

- a) What effect, if any, does the initial amplitude have on the time period?
- b) Explain your findings
- c) How many different angles did you try? Why should you not try angles that are too high?

## Experiment 2: Changing the mass

- Pull the pendulum bob to one side and let go.
- Count 10 complete swings past the pin marker, and stop the watch
- Record this time, and then divide it by 10 to find the time period.
- *Repeat, keeping the initial amplitude the same and alter the mass of the pendulum bob by adding blue tac to it, weigh on scales*

### **Evaluation questions 2**

- a) What effect, if any, does the mass of the pendulum bob have on the time period?
- b) How many different masses did you try? Do you think that this number was sufficient?

## Experiment 3: Changing the length

- Pull the pendulum bob to one side and let go.
- Count 10 complete swings past the pin marker, and stop the watch
- Record this time, and then divide it by 10 to find the time period.
- *Repeat, keeping the initial amplitude and mass the same, and alter the length of the pendulum by pulling it through the wooden blocks. Measure the length and record your results*

### **Evaluation questions 3**

- a) What effect, if any, does the length of the pendulum have on the time period?
- b) Plot a graph of length against time period.
- c) What shape is the graph line? What does this tell you about how the time period changes with length?

## Pt 2: Equation for a simple pendulum

Time period of a swinging pendulum:

$$T = 2\pi \sqrt{\frac{L}{g}}$$

T: Time period (s)

L: Length of pendulum (m)

g: acceleration due to gravity (or gravitational field strength),  $\text{m/s}^2$  or  $\text{N/kg}$

# Pendulum

$$T = 2\pi \sqrt{\frac{L}{g}}$$

So how can we affect the time period of a pendulum?

Longer string →

Smaller  $g$  →

Larger mass →

## Pt 2: Equation for a simple pendulum

$$T = 2\pi\sqrt{\frac{L}{g}}$$

$$\frac{T}{2\pi} = \sqrt{\frac{L}{g}}$$

$$\left(\frac{T}{2\pi}\right)^2 = \frac{L}{g}$$

$$\frac{T^2}{4\pi^2} = \frac{L}{g}$$

$$g \cdot \frac{T^2}{4\pi^2} = L$$

$$g = \frac{4\pi^2 L}{T^2}$$

Whiteboards!

$$T = 2\pi\sqrt{\frac{L}{g}}$$

$$T = 2\pi\sqrt{\frac{L}{g}} = 2\pi \times (1/9.81) = 2.01\text{s (to 3 s.f.)}$$

1. Calculate the time period of a pendulum of Length 1m on Earth
2. Rearrange the equation to make “g” the subject

Challenge: Calculate the ratio between the time period of a pendulum on the Moon compared to the Earth ( $g_{\text{moon}} = 1.6 \text{ m/s}^2$ )

# Finding “g”

- Measure the length of your pendulum and record it
- Pull the pendulum bob to one side and let go.
- Count 10 complete swings past the pin marker, and stop the watch
- Record this time, and then divide it by 10 to find the time period.
- Repeat with **another length of pendulum**
- *Use the equation to calculate “g” for each length.*  
*What do you notice?*

*Extension 1: What would this experiment look like if you carried it out on the Moon? Calculate specific numbers*

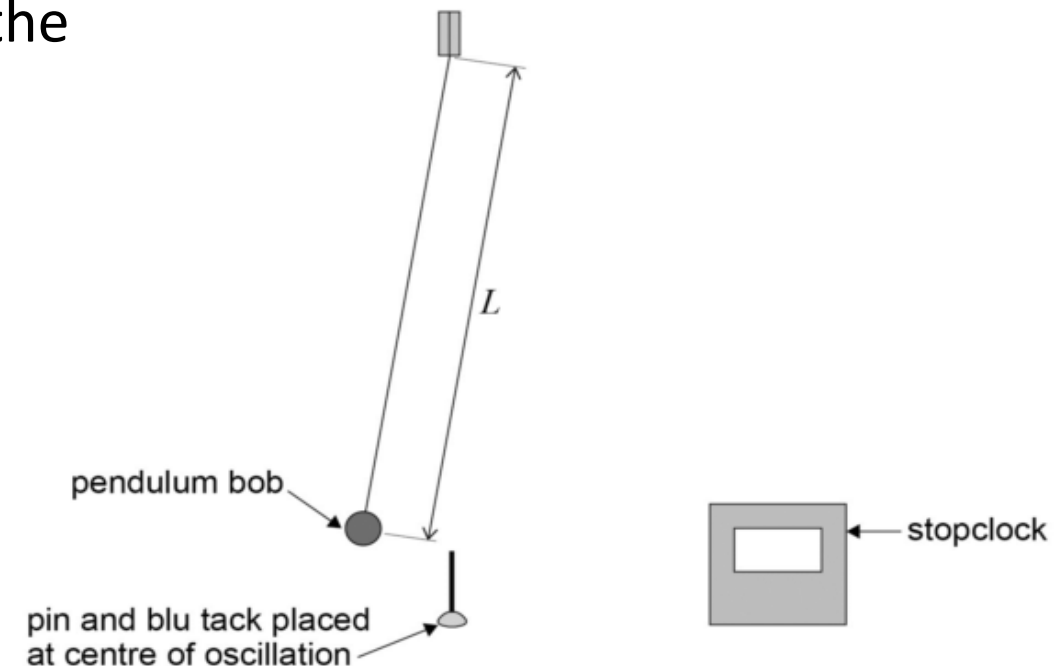
*Extension 2: How could you use energy transfers to calculate the maximum speed a pendulum should have?*

$$T = 2\pi \sqrt{\frac{L}{g}}$$

T: Time period (s)

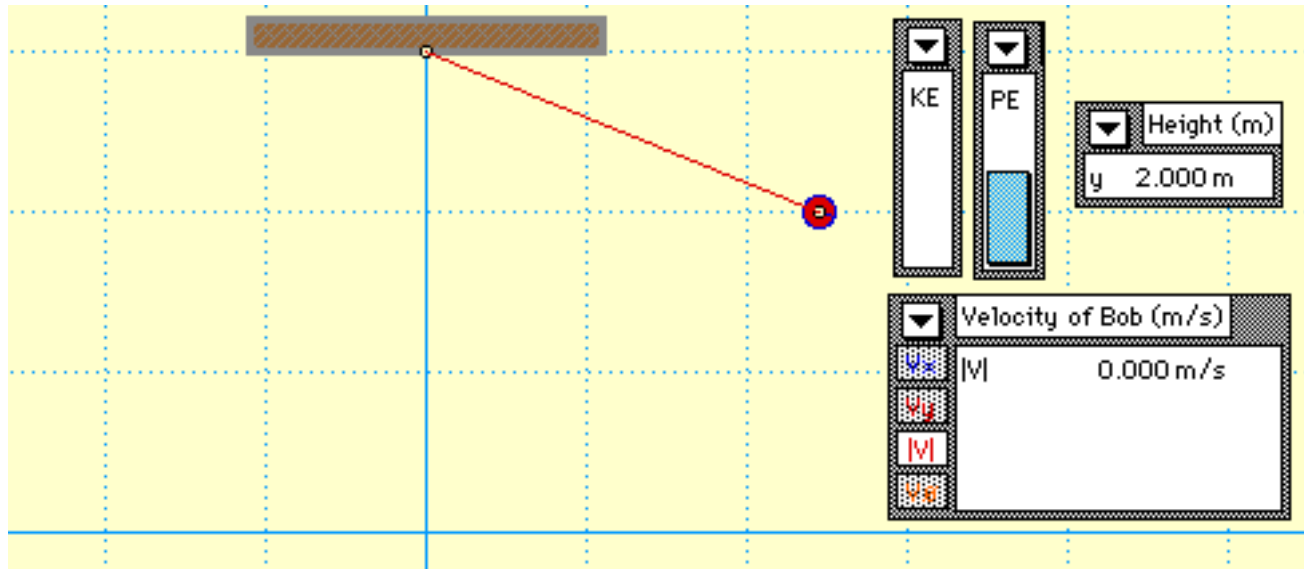
L: Length of pendulum (m)

g: acceleration due to gravity, m/s<sup>2</sup>



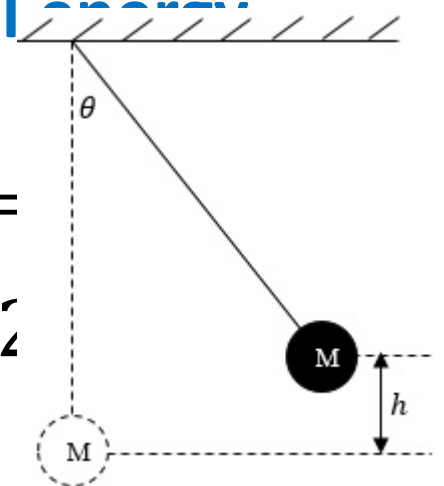
# Extension 2

*How could you use energy transfers to calculate the maximum speed a pendulum should have?*



**Kinetic energy = Gravitational Potential**

$$\frac{1}{2}mv^2 = mgh$$
$$v = \sqrt{2gh}$$



[https://phet.colorado.edu/sims/html/pendulum-lab/latest/pendulum-lab\\_en.html](https://phet.colorado.edu/sims/html/pendulum-lab/latest/pendulum-lab_en.html)

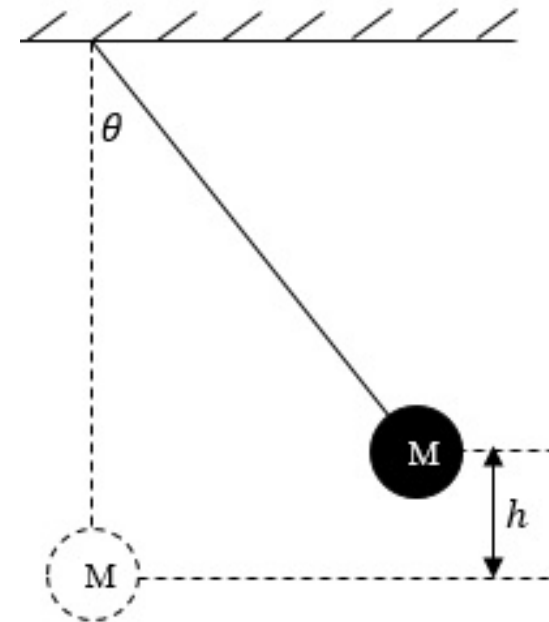
# Extension 2

*How could you use energy transfers to calculate the maximum speed a pendulum should have? Use the speed sensors to check your results...*

**Kinetic energy = Gravitational  
Potential energy**

$$\frac{1}{2}mv^2 = mg\Delta h$$

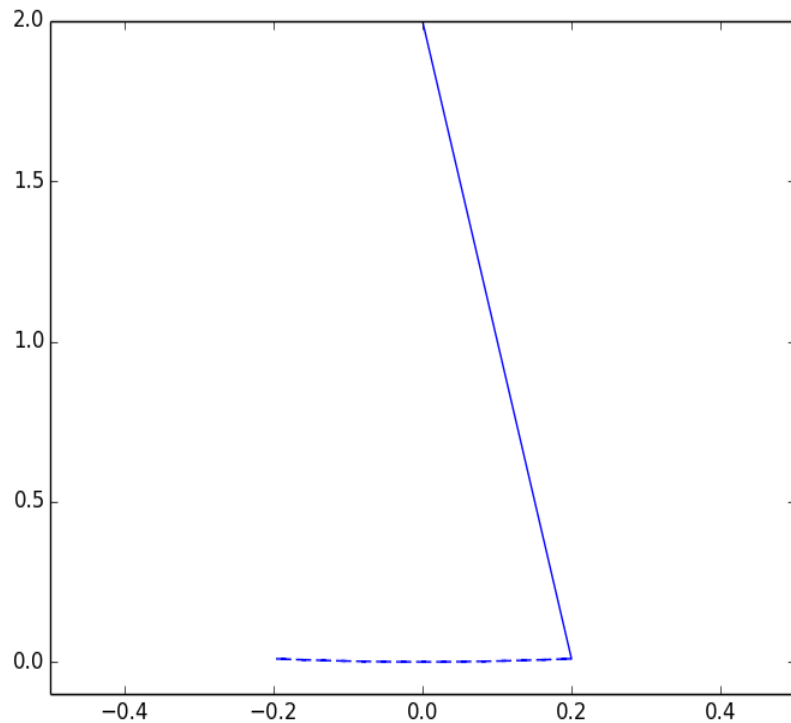
$$v = \sqrt{2g\Delta h}$$



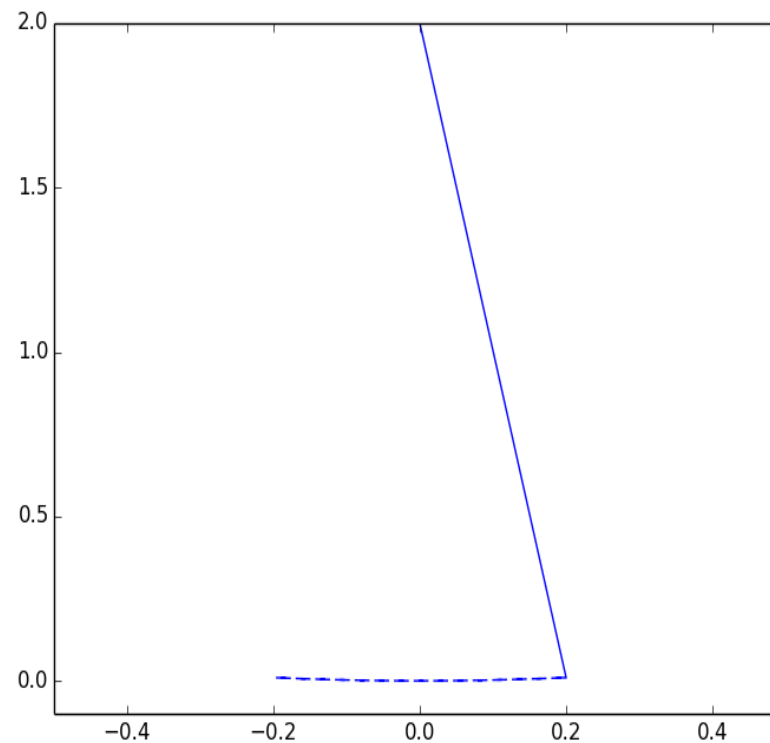
# Extension 1: Pendulums and gravity

Which pendulum would you find on Jupiter, Earth or the moon?  
What would a pendulum look like with no gravity?

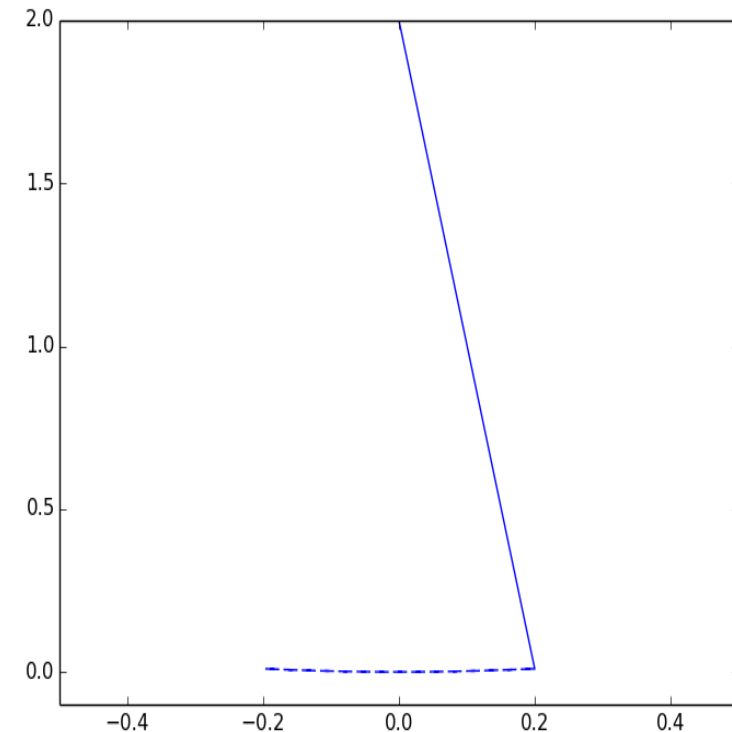
Moon



Earth



Jupiter (greatest gravity)

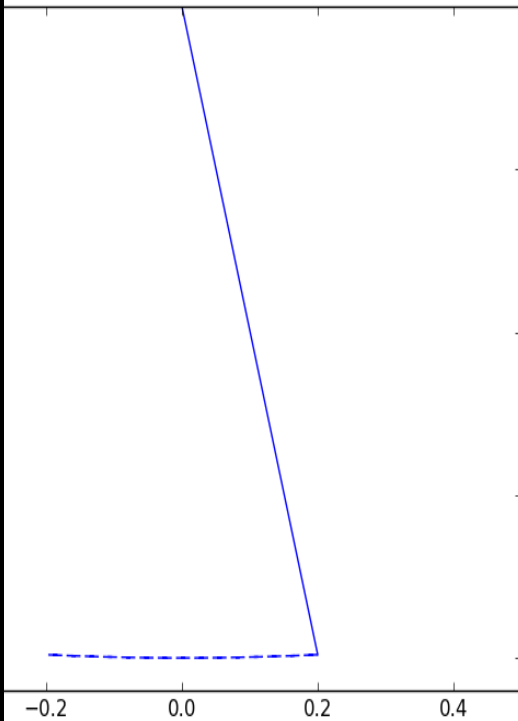
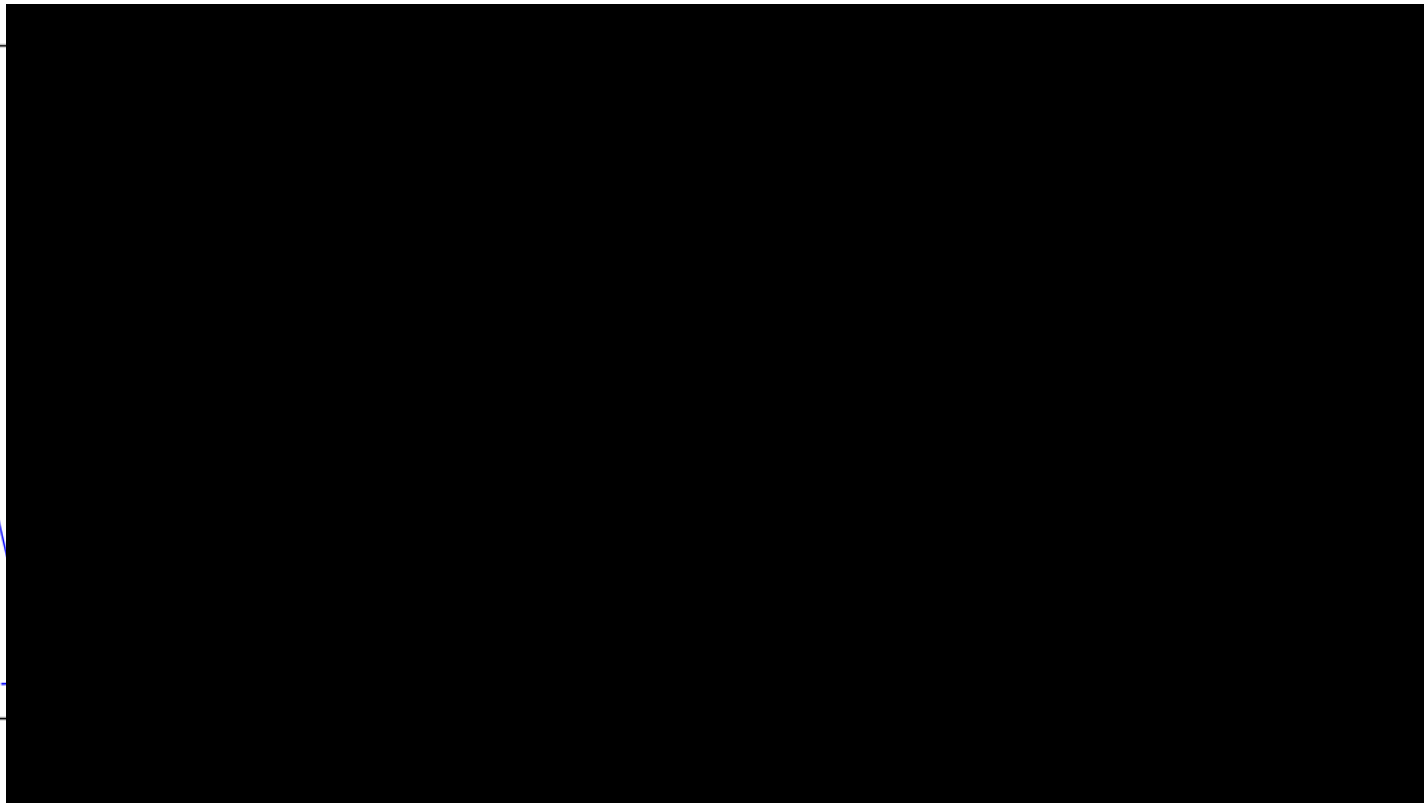
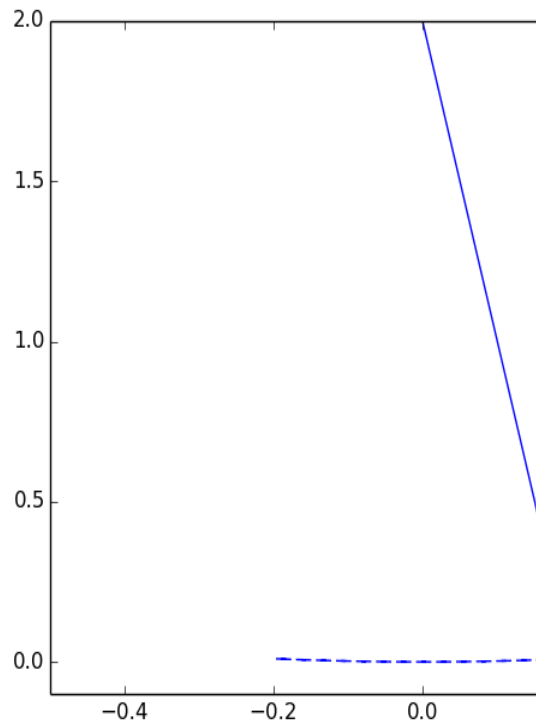


# Pendulums and gravity

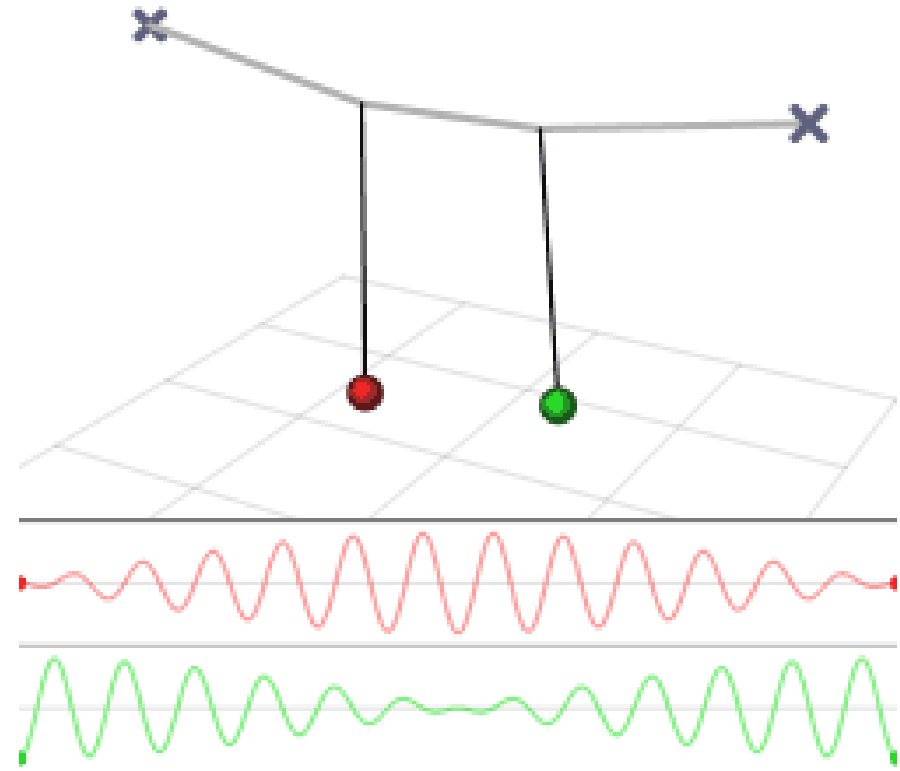
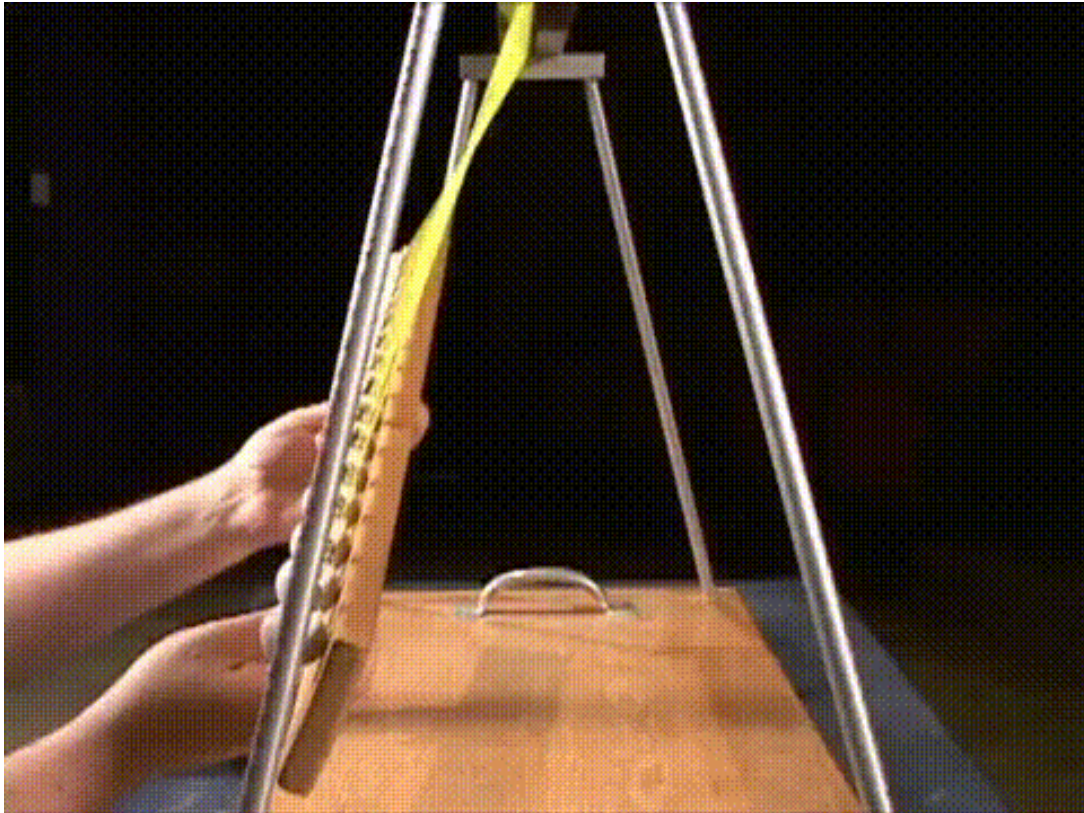
Which pendulum would you find on Jupiter, Earth or the moon?

What would a pendulum look like with no gravity?

**In free-fall on the I.S.S.**



# Other pendulums...

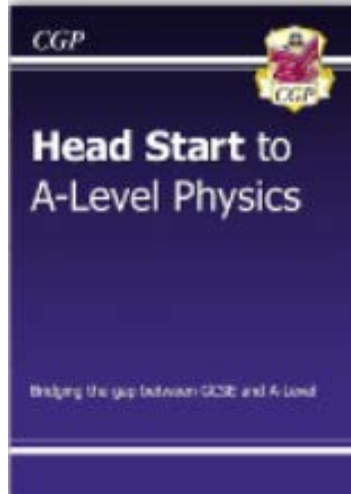


# Questions?

- See me or Mr Curnow at the end 😊

# Holiday homework...

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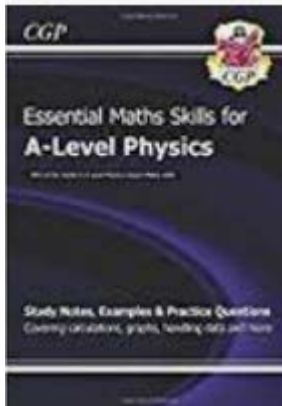


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