# Mathematics: **Parent Information Session**

| Astrophysics | Politics | Imaginary |
|---|---|---|
| A day on Jupiter lasts about 10 hours. Write a product to show how many hours are in 10 Jupiter days. Then find the value of the power. | In the year 2020, Joe Biden, received about $10^6$ votes to win the election. Write this as a product. How many votes did Joe Biden receive? | The Luck Dragons that live in the Enchanted Forest in Chitwan National Park weigh $4x$ kilograms when they are $x$ years old. What are the weights of 6-year old, 8-year old, and 10-year old Luck Dragon. |

$10^2$ ✓

1,000,000 ✓

6 year old - 24 Kg
8 Year Old - 32 Kg
10 year Old - 40 Kg ✓

# A Challenge For You…

The coloured shapes stand for **eleven** of the numbers **between 0 to 12**. Each shape is a **different number**.
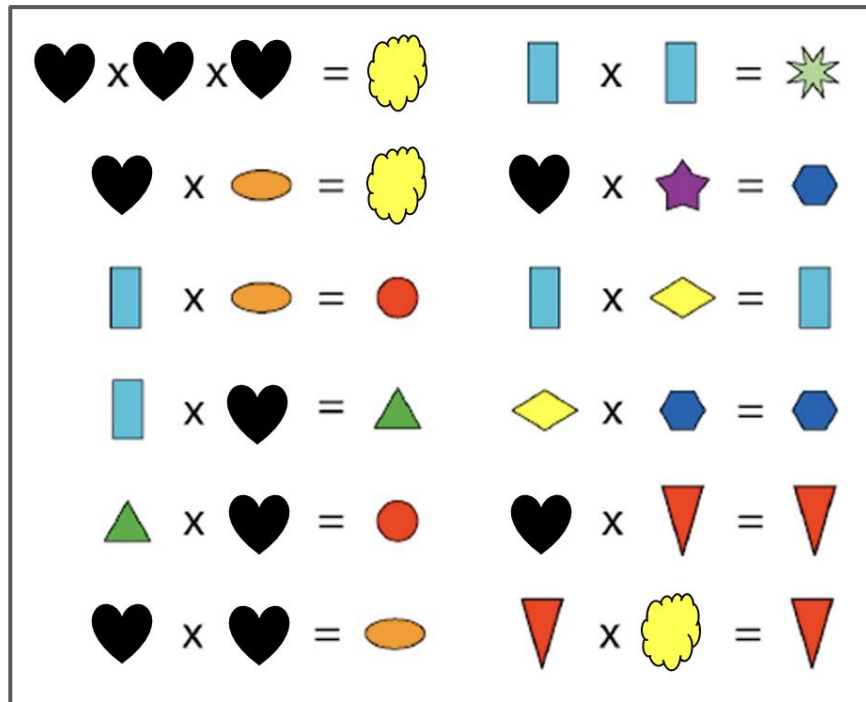
# Mathematics @ TBS

- Students should be taught **more than theorems and processes**

- Increasing focus on **how** to solve problems:
    - extracting key information
    - identifying what needs to be learnt
    - learning new skills (if necessary)
    - solve real-world problems

- Developing **cross-curricular links**

- Making mathematics **relevant** and **fun**



*"What is mathematics? It is only a systematic effort of solving puzzles posed by nature."*- Shakuntala Devi

# Schemes of Work

Teacher's Time Plan

| Term 1 | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | |
|---|---|---|---|---|---|---|---|
| Y7 | L1 | 7N1 | 7N2 | 7N3 | 7N4 | 7G1 | Test 1 | End of Term |
| Y8 | L1 | 8N1 | 8N2 | 8N3 | 8N4 | 8N5 | Test 1 | |
| Y9 | L1 | 9N1 | 9N2 | 9N3 | 9N4 | 9N5 | Test 1 | |

Parent's Curriculum Map

| | | Year 8 | Year 9 |
|---|---|---|---|
| | | **Term 1** | |
| Content | **Topic 2:** Geometry (7G1, 7G2)<br>**Topic 3:** Number (7N5, 7N6, 7N7) | **Topic 1:** Number (8N1, 8N2, 8N3)<br>**Topic 2:** Algebra (8A1, 8A2)<br>**Topic 3:** Number (8N4, 8N5)<br>**Topic 4:** Data (8D1, 8D4) | **Topic 1:** Number (9N1, 9N2, 9N3, 9N4, 9N5)<br>**Topic 2:** Algebra (9A1, 9A2, 9A3) |
| Skills | **Number:** mental arithmetic, BIDMAS, working with negative numbers and decimals and rounding number. Using factors and multiples, converting between fractions, decimals and percentages, understanding ratio and proportion.<br>**Geometry:** Knowing key terms for defining angles. Working with angle rules and bearings. | **Number:** Types of number, using negative numbers and rounding. Converting between fractions, decimals and percentages, working with proportion.<br>**Algebra:** Manipulating algebra, substitution and using brackets.<br>**Data:** Calculating with theoretical and experimental probability. | **Number:** factors, multiples, decimals, rounding, indices and standard form. Converting between fractions, decimals and percentages and calculating with all four operations using fractions.<br>**Algebra:** Simplifying, rearranging factorising and expanding algebraic brackets as well as calculating with algebraic fractions. |
| Assessments | Tests, and Home Learning tasks (MyiMaths). | Tests, and Home Learning tasks (MyiMaths). | Tests, and Home Learning tasks (MyiMaths). |
| | | **Term 2** | |
| Topic and Content | **Topic 1:** Data (7D1, 7D2)<br>**Topic 2:** Algebra (7A1, 7A2) | **Topic 1:** Data (8D2, 8D3)<br>**Topic 2:** Geometry (8G1, 8G2) | **Topic 1:** Data (9D1, 9D2)<br>**Topic 2:** Geometry (9G1) |
| Skills | **Data:** Finding averages and range, constructing graphs and charts<br>**Algebra:** Generating and describing sequences and mappings. | **Data:** Finding averages and range from a table, constructing charts and graphs<br>**Geometry:** Angle rules, parallel line angle rules, angles in polygons. | **Data:** Finding averages and range from a table, constructing charts and graphs. Analysing sets of data and drawing conclusions.<br>**Geometry:** Constructing shapes using compass and protractor, using loci to solve problems |

- **IGCSE syllabus** informs planning - looking at skills required <u>for Extended</u>

- Most timelines follow **a spiral structure**:
  - most topics are revisited
  - building on prior learning
  - increasing difficulty and contexts

- Students have **different access points**: *B/D/M*

# Schemes of Work

|  | Year 7 |
|---|---|
|  |  |
| Topic and Content | **Topic 1:** Number (7N1, 7N2, 7N3, 7N4)<br>**Topic 2:** Geometry (7G1, 7G2)<br>**Topic 3:** Number (7N5, 7N6, 7N7) |
| Skills | **Number:** mental arithmetic, BIDMAS, working with negative numbers and decimals and rounding number. Using factors and multiples, converting between fractions, decimals and percentages, understanding ratio and proportion.<br>**Geometry**: Knowing key terms for defining angles. Working with angle rules and bearings. |
| Assessments | Tests, and Home Learning tasks (MyiMaths). |
|  |  |

**Content:** the different topic titles and teaching codes

**Skills** being learnt in each topic - there is often overlap between topics

**Assessment:** How we know they are making progress

# Mathematics Structure

| | | |
|---|---|---|
| **KS3** (Year 7 - 9) | Adapted version of the UK national curriculum | mixed-ability classes internal assessments grades 1U - 9A* |
| **KS4** (Year 10 - 11) | Cambridge iGCSE Mathematics (CAIE 0580) | mixed-ability, until Y10 December course split into Extended (A* - C) or Core (C - G) two exams in Year 11 |
| **KS5** (Year 12 - 13) | Cambridge AS/A2 Mathematics (CAIE 9709) | students study Pure (P1 and P3) and Applied (S1 and M1) two exams in Year 12 two exams in Year 13 |

# iGCSE Mathematics

- The course is **changing from next year!**

- Content **stays the same**: assessments are changing:
  - one **non-calculator paper** and one calculator paper, equally weighted
  - Mixture of short (recall) and longer (problem solving) questions **in both**

- Students will need to improve their number sense
  - Year 9 curriculums adapted **straightaway**
  - Year 7 - 8 and Year 10 - 11 curriculums adapted **from next year**

# AS/A2 Mathematics

More information in the Options Evening in a couple of weeks time!

## A Level Maths - CAIE 9709

### AS Only (Year 12)

**P1**: **Pure Maths** - algebra, number, graphs, geometry, calculus.

60% of AS grade
1 hour 45 min
(Calculator)

75 marks

**S1**: **Statistics and Probability** - analysing data, probability, types of distributions

40% of AS grade
1 hour 15 min
(Calculator)

50 marks

### A Level (Year 12 + 13)

P1 (from Year 12): 30% of A Level grade

**P3**: **Pure Maths** -

30% of A Level grade
1 hour 45 min exam
(Calculator)
75 marks

S1 (from Year 12): 20% of A Level grade

**M1**: **Mechanics** (applied)

20% of A Level grade
1 hour 15 min exam (Calc)
50 marks

# Teaching and Learning

- Students will have **different access points**
- Students should make progress **compared to themselves**

- Resources are **shared on Google Classroom**:
  - lesson slides
  - worksheets (scaffolded, difficulty levels)
  - (where possible) extension challenges

- Use of textbooks
  - Textbooks for all Year 12 - 13
  - Occasional textbook use at iGCSE
  - In-class textbooks for Year 7 - 9

# Teaching and Learning

Students might not need all the equipment every lesson but should have everything ready for whenever they need it!
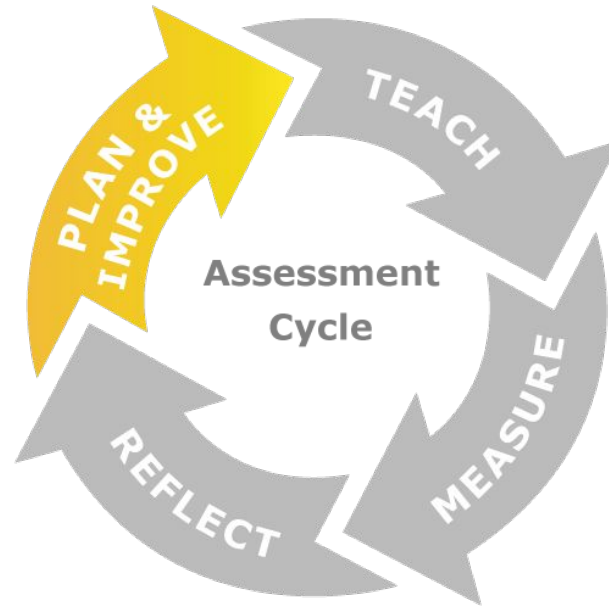
# Homework



- KS3: 30 to 45 minutes per week
- KS4: approximately an hour
- KS5: an hour a day!

- Homework is **MyiMaths** or **a worksheet**:

- Students should be **'passing' each activity**, not just rushing through the work!

- More use of **exam questions** towards the end of the course, particularly with Y11 - 13

# Assessment Cycle

- constant revision in and out of lessons
- revisiting topics if necessary

- students provided with **revision lists** (1 week)
- revision lessons



**Assessment Cycle**

PLAN & IMPROVE · TEACH · MEASURE · REFLECT

- review lesson
- follow-up homework
- self-evaluations completed by all students

- assessments <u>at least</u> **once a term**
- cumulative assessments
- mixture of calculator and non-calculator

# Support for Students

- Support in lessons with scaffolded worksheets
  or different types of questions

- There are **support** clubs:
  at least once a week (split next term)

- Drop-In sessions take place
  **at lunch on Tuesdays**

- Subscriptions to a whole host of websites:
  - MyiMaths
  - Mangahigh (KS3 only)
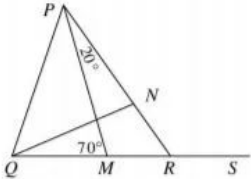  - Education Perfect (KS4 only)
  - DrFrostMaths

# Support and Challenge

- In-Lesson:
  - focus on **communicating mathematics**, not just producing answers
  - different worksheets always available
  - starting to introduce **UKMT challenge questions** and **cross-curricular problems**

- **Challenge Club** takes place **every Wednesday**!

- Introducing more competitions this year:
  - UKMT Maths Challenges
  - FOBISIA Competitions
  - Chandra Kala Challenges (weekly)
  - House Maths Olympiad

United Kingdom Mathematics Trust

In the diagram $\angle RPM = 20°$ and $\angle QMP = 70°$. What is $\angle PRS$ ?

A  90°          B  110°     C  120°     D  130°
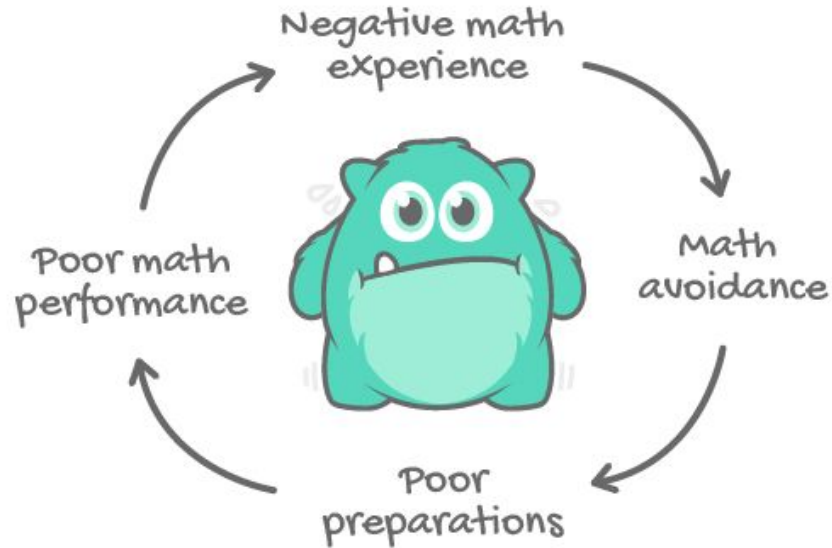
# Mathematics @ Home

Researchers found that when mothers told their daughters they were not good at math in school, their daughter's achievement declined almost immediately!

*The parents' math[s] knowledge did not turn out to have any impact, only their level of math[s] anxiety.*

Eccles, J., & Jacobs, J. (1986). Social forces shape math attitudes and performance. Signs, 11(2), 367–380.

# Mathematics @ Home

**What practical steps can we take at home?**



Math anxiety cycle of failure

# Mathematics @ Home

**You can help us by:**

- Focusing language around the *joy of maths*:

    *"You can do this, I believe in you, math[s] is an open, subject that is all about effort and hard work."*

- Stop enforcing our own historical trauma! (Eccles & Jacobs, 1986)



Eccles, J., & Jacobs, J. (1986). Social forces shape math attitudes and performance. Signs, 11(2), 367–380.

# Mathematics @ Home

**Practical Steps:**

- Ensure students are doing homework and **actually trying**

- Encourage children to show more complete working out - ask them *Why?*

- Avoid use of calculators and help practice times tables - *Spotify has a lovely playlist!*

- Keep in touch! *Email me if you have any concerns (or positives!)*

# Any Questions?

# Maths Website



"Mathematics is not about numbers,

# Chandra Kala Challenge (25 Nov)

The coloured shapes stand for **eleven** of the numbers **between 0 to 12**. Each shape is a **different number**.



Check the Yeti News for this week's challenge and email your answers to me!