

## Prompts for exam preparation strategies

### Stationery

Get a new revision folder for the pupils. They need to feel that exam prep is new and different, a strategic approach to a forthcoming event. Coloured paper, pens and post-its can all have this effect.

Be selective – when pupils have created something useful for their revision put it in the folder. Published materials are also good but not as useful as revision aids the pupils make for themselves.

Model what a good folder should have in it. Create one for yourself that the pupils can reference. Ask pupils for a copy of something they have done, e.g. “It is so good I want it in the class revision folder. If I am getting it copied – would anyone else like a copy for their folder?”

### Index cards

Pupils create their own revision cards as they meet a topic/term/technique that they know but are inclined to forget. This is very useful for easy one mark questions on the first half of the paper e.g. a prime number between 20 and 50 is an easy mark but only if you remember what a prime is!

- Pupils do the first half of the paper, mark their own or a partners work using your handwritten solution or the mark scheme
- They total their marks and you let them know how far from the grade C threshold they are – this reinforces the importance of getting all the marks they can on the easier questions
- Handout index cards. On the front of the card they write the term of topic e.g. prime numbers. On the back they write something which will help them to remember what a prime is. Let them sue their own words and examples. Not all pupils will need to do the same cards. This is personal to them.
- Model how you would write a few cards and keep some as an example pack. Keep doing this in other lessons as you come across things which are easy to forget. Keep the cards handy.
- When you have a small stack of cards, model how you would use them to revise “I would read the front and think ‘do I remember this?’ If I can I put the card down in one pile. If I can’t I read the back and put it in another pile. As I get better I hope the relative size of the piles change! I also would get my friend or Mum to test me.”

## Using prepared 'wrong solutions' to an examination question

### Find an error- extend the question

Choose the question carefully and think about what error to include and why.

There are extensive questions which can be asked using an exam question/wrong solution as a stimulus e.g. Ask:

- What is this pupil thinking?
- Where is the error?
- How many marks would this solution have obtained?
- How could it be corrected?
- What is a useful hint or tip for this pupil?
- How would the question be answered using a different method?
- What else could be asked about this question i.e. make up another part for the question.
- Write a solution to the extra part
- Give the extra part to another pair
- Mark their solution

Keep the wrong solutions –they can be used again as part of a structured revision programme

### Formative marking and 'golden rules'

Pupils work in pairs on similar questions some of which have incorrect solutions. They make formative comments and answer the other questions. As they do this they complete a list of 'golden rules' about these sorts of questions.

### Comparative answers

Students are given several pupil scripts which they check and mark before arranging them in order of 'best answers'. Teacher then discusses with the class which answers would gain maximum marks. Students are encouraged to try and work out where the other students went wrong.

## Working on images

### Reading Images

This very basic but powerful technique involves providing pupils with a visual image as a source of information and asking them to annotate or label it. They are asked to make links to what they already know, whether from previous work or general knowledge. As with other thinking strategies, it is important for pupils to be able to explain their thinking to others. Reading images can

- help activate pupils' knowledge in relation to a particular topic;
- encourage pupils to be more creative in their thinking both about the subject matter conveyed through an image and more generally to consider the way images are used to communicate meaning;
- encourage pupils to evaluate visual representations presented to them and to be more discerning about images they devise to present as part of their own work.

Practicalities – put pupils in pairs or threes and put the image in the centre of a large piece of paper. Mark off 4 borders as shown below. Give pupils headings for their annotations in each border.



For example, the image could be a diagram or table from an exam question or the entire question. Headings for borders could be as follows:

1. What do you know about this topic – any formulae or definitions?
2. What are the key words in the question?
3. Solve the problem
4. Check your answer – show the strategy

An example could be a shape transformed in several ways on a pair of coordinate axes. The pupils have the opportunity to make links between any pair or pairs of shapes, since the object of the transformations is not specified. It will stimulate discussion of equivalence, inverse, scale and proportion.

### Design a question for this image....

Give pupils an image and ask them to design a GCSE exam question using that image. On a separate sheet of paper (a different colour?) they should write the solution and allocate marks to parts of the solution. Either:

- Collect them in and use them in the next lesson
- Or check them during the lesson and pass the question to another pair and back to the designers to be marked

- Or distribute strategically for homework

Choose the image carefully. It could be any of the following:

- A graph
- A statistical diagram
- A statistical table (grouped or ungrouped)
- A spinner or dice
- A tree diagram
- One or two geometrical shapes
  - 2-d or 3-d
  - With or without dimensions (lengths, angles)
  - With extended sides
- Net of a solid
- Maps
- Bearings
- Loci diagrams
- A pair of intersecting lines
- A shape (or set of shapes) on a grid
- One or two segments of a number line
- A poster or ticket showing prices per person or per item
- A price list or a shopping list
- A recipe
- A meter (gas, electricity)
- Bus or train time table
- A two way table
- A list of numerical values (with or without units)
- Number line

### **Collective Memory**

Pupils really enjoy this strategy because of the competitive element, but it requires planning, thought and debriefing skills from teachers to maximise the learning outcomes. If you are concerned about them being overexcited then the image can be shown on an interactive whiteboard.

Choose an A4 sheet that presents information in a way that has some obvious physical structure and has some importance to the topic: a diagram or other text with obvious structure. If you are making up a sheet of your own, the judicious use of colour can often help pupils to link information and talk about its location on the page. E.g. a set of interconnected mathematical statements such as an equation, a table and a graph

Arrange pupils in groups of three or four and tell them that they are going to have to reproduce, as accurately as possible, something you have covered up at the front of the classroom. Taking individual turns they are only going to see it three times each and for 10 seconds each go. They can have 2 minutes before the first go to plan their general strategy and what the first person will do. After each go, give them time (1 or 2 minutes– a timer is useful) to record their findings and plan the next visit.

Encourage them to cooperate and support one another.

To support lower-achieving pupils you might:

- choose an image that has a very simple structure and limited detail;
- provide a sheet that scaffolds their first visits by instructing them to find the main lines and getting an idea about the overall nature of the image;
- create groups so that pupils with strong visual memories (if you know who these are) are distributed between groups.

To challenge higher-achieving pupils you can speed up the rounds after a few visits so they get no planning pause and have to plan three or four visits in advance. This puts them under real pressure and leads to interesting learning outcomes. It tends to emphasise the value of checking and monitoring work continually.

## Working on graphs

### Sign graph

This is an interactive whiteboard activity for active or smart boards. A travel distance/time graph is displayed with movable 'road signs' (such as 30mph) that students place at the appropriate part of the graph. Pairs are given a paper copy of the graph; they cut out the signs and stick them in the appropriate place on the graph. They must justify the position of each sign and write a sentence to explain their decision. Take feedback and as a whole class refine one or two explanations then put pairs to fours to refine other explanations. (Supporting files available)

### Reading graphs

Take a series of conversion graphs and distance/time graphs and stick them on large sheets of paper in 4 corners of the room. Place the pupils in pairs and identify them as pupil A or pupil B. Pupil A receives a simple question based on one of the graphs which he/she takes back to his partner and reads to them (does not hand to them). Pupil B then goes to the graph display and attempts to answer the question. Swap A and B for question 2 and so on. 10 questions is about right. (Supporting files available)

## Other

### Jumbled questions or solutions

Slice up a few similar exam questions, put in envelop and ask pairs to sort them into a question and then answer the question. A good type of question would be a set of axes, a partly completed table, an equation and a few related questions. Make sure that some could go with any question so there is some debate. This task makes them look at the link between the axes and scale, the range of values in the table, the equation and the text of the questions.

### Jigsaw groups on an exam paper

'Expert' pupil groups jointly do a few questions on a specific topic, from an exam paper together. All return to their 'home' groups which will now comprise an expert

for each topic/question on the paper (or part- paper). All in the group now complete all questions with the support of their 'experts'.

As homework or in rearranged classroom all now do similar paper or part-paper under test conditions.

### **'Easy question' tag**

One or two mark 'easy' GCSE questions from the first half of the non-calculator paper are selected cut-out, stapled together from question 1 to question n. Students are placed in mixed-ability groups of 3 or 4. One 'player' from each team comes and collects Q1 to take back to their team. The team answer the question, return it to the teacher and, if correct, they collect Q2. If it is incorrect, they returned to the team and do Q1 again until it is correct. The winning team is the one that completes all the questions first. (Supporting files available)

### **Design a poster**

Students are asked to design a poster as an aid for a younger group around a particular area of mathematics

### **RAG rating questions**

Students are given a range of questions which they 'RAG' rate. Green ones can be placed to one side, amber ones are worked on by the group and red ones are returned to the teacher. Teacher then teaches a mini-lesson around the red topics

### **Pooling notes on vocabulary**

Pupils in groups, each with a different exam paper. They go through a paper and, on post-its, list all the technical mathematical vocabulary. They sort the post-its into groups (perhaps by strand e.g. algebra, number etc.), stick them on a big piece of flipchart. and start making notes next to them – anything they know, any diagrams which can help. Allow a fixed time for this activity. When the time is up pupils then move to another table and add to the notes made by the previous group.

### **Same question different context**

What is the same about these questions?

What is different about the questions?

How many marks would be given to the answers in a GCSE exam and what would you get marks for?

- 1 The school caretaker knows that 349 people have booked to attend a meeting in the hall. The chairs are to be set out in rows of 18. How many rows are needed?
- 2 When 18 friends go out for a meal they agree to split the bill of £349 equally. How much should each person pay?

- 3 Katrina has baked 349 muffins and is packing them in boxes of 18. How many boxes can she fill and how many spare buns will she have?
- 4 Sam cycles 349 miles in 18 hours. What was his average speed, in miles per hour?
- 5 Emlyn returned from the USA with \$34.90 and exchanged it for pounds at the rate: £1 = \$1.80. How much did he get?

Give another division calculation and ask pupils to make up a new set of problems.

Make up 3 more questions for the division calculation  $265 \div 32$ .

Write them so they look like a GCSE question and show how many marks a correct answer would be given?