Quick Maths Energisers

Boost students' engagement

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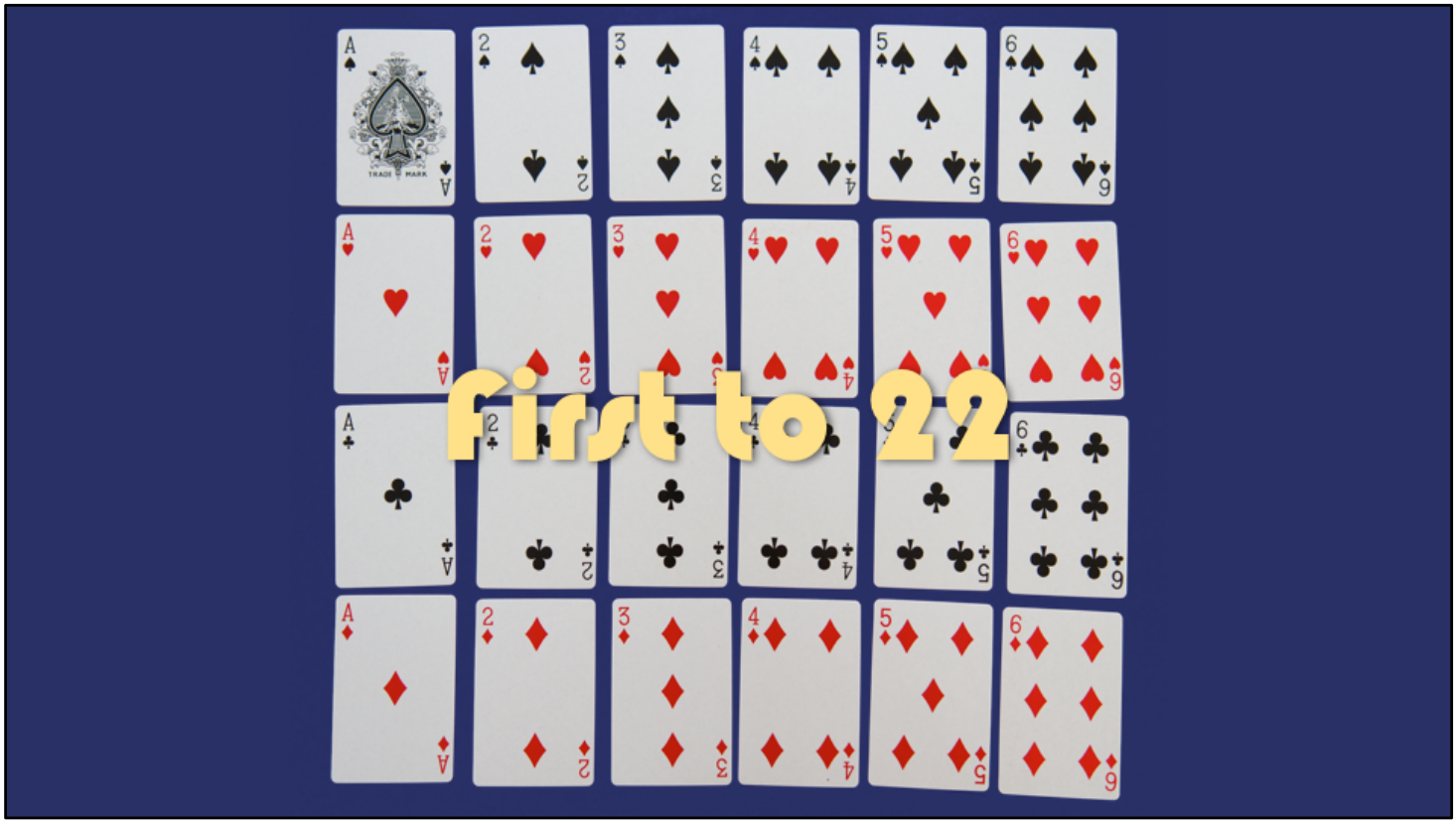


First to 22

Equipment Needed:

Teacher:

- A deck of cards for the demonstration (only need the Ace, 2, 3, 4, 5 & 6)

Students:

- 1x deck of cards between 2 students

Learning Goal:

- To be able to add numbers and look for patterns.

Success Criteria:

- Add numbers past 10
- Recognise key numbers to hit on the way to 22
- Generalise to write an algebraic rule

Overview of activity:

- Locate the A, 2, 3, 4, 5 and 6 of each suit from a deck of cards.
- Lay them out in 6 rows based on their number.
- Student one flips a card so that it is upside down and says the total of that card.
- Student 2 flips another card over and adds it onto the first card.
- Student 1 then flips another card over and adds it to the total of the first 2 cards.

- This continues until the total reaches 22.
- The student who flips the card over to total 22 is the winner. They must sing “I don’t know about you, but I’m feeling 22” by Taylor Swift as they flip over the last card.
- The winner then gets to choose who starts the next game.
- Students to play a few games then switch partners

Extensions/ Other things to consider:
- Encourage students to identify the numbers that they must ‘hit’ in order to ensure they win
- Ask the question - If you win, who do you want to start the next game to ensure that you win again?
- Change the game - Make the target number another number and see how this affects the numbers you need to hit.
- Bring in the number 7 to go with A-6. How does this affect the other numbers you need to hit along the way?
- Get students to generalise
- Get students to write an algebraic rule

Paper Cuts

Equipment Needed:
Teacher:
- 6x A5 pieces of paper (or 3x A4 pieces of paper cut in half)
- 1 pair of scissors

Students:
- Piece of A4 paper (loose leaf or in their book) with 6 rectangles drawn on it.
- Pen/pencil

Learning Goal:
- To be able to reflect shapes across a line of symmetry

Success Criteria:
- Identify where the line of symmetry occurs.
- Describe a shapes location in reference to the line of symmetry.
- Accurately reflect a shape across a line of symmetry
- Accurately reflect multiple shapes across a line of symmetry.

Overview of activity:
- Instruct students to draw 6 rectangles on a piece of paper or in their book.
- Teacher to hold the piece of paper in landscape position and fold it in half so that

students can see.
- Teacher then to make 1-2 cuts on the folded piece of paper. These cuts can be any shape. Basic shapes work the best. Remember to once again show where the fold has been made by pointing it out to students.
- On the first rectangle, students are to draw what they think the piece of paper will look like when the teacher opens it back up again.
- Once all students have done this, teacher is to open up at the fold so that students can compare what they have drawn to the final result.
- Repeat another 5 times and add in any of the extensions below.

Extensions/ Other things to consider:
- Make more cuts
- Make cuts along the fold, and cuts in the corners.
- Change the shape that you are cutting out.
- Make 2 folds initially, one horizontal and one vertical (this will require some scaffolding for students to move to)
- Fold in half vertically, then in half vertically again.
- Get students to also explain what is occurring using terminology such as ‘reflection’, ‘x-axis’, ‘y-axis’, ‘axis of symmetry’ etc.

Estimation 180

Equipment Needed:
Teacher:
- Laptop
- Projector

Students:
- 1 of the following:
- Device with a spreadsheet application open
- Pen/pencil and paper

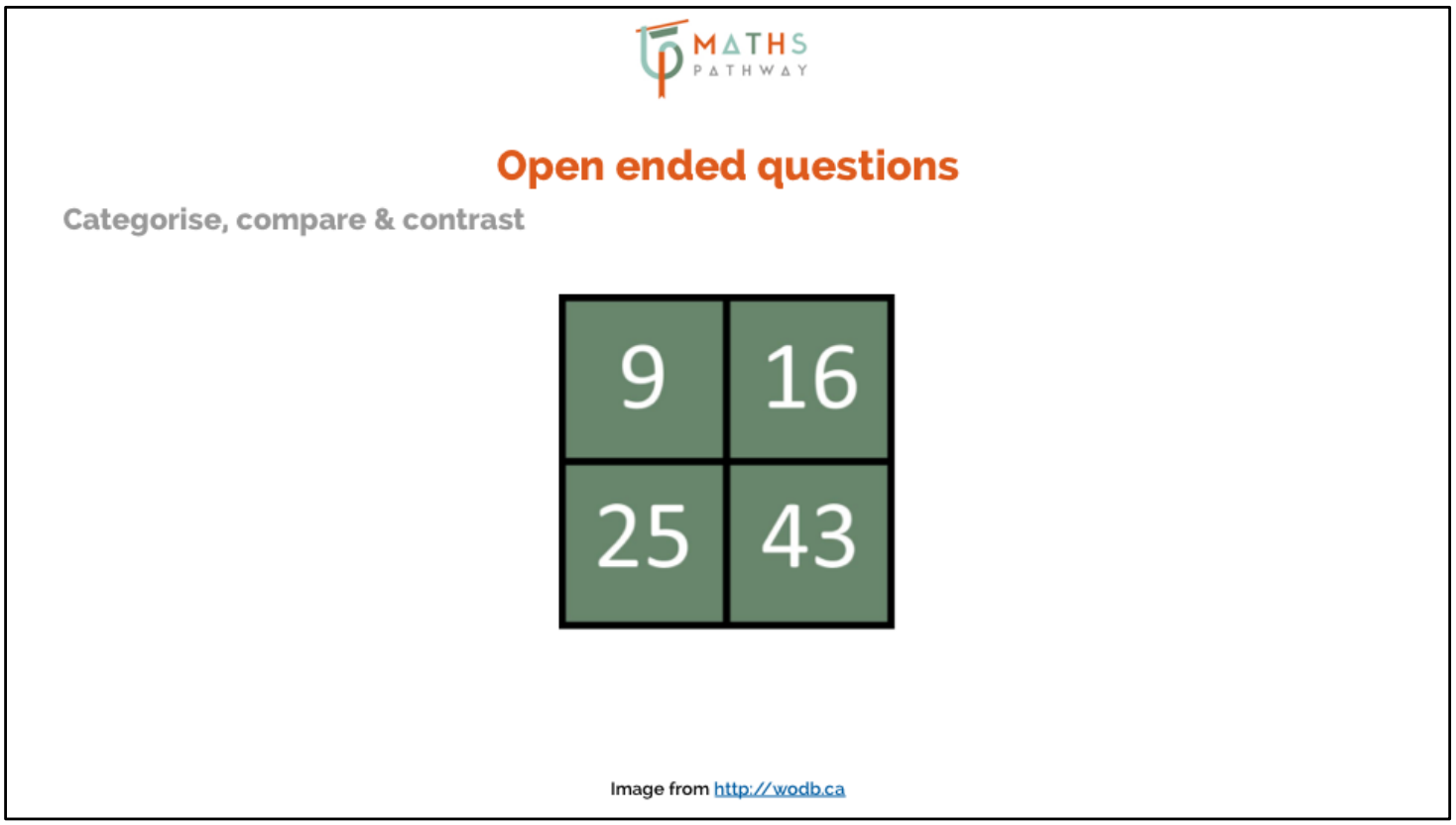
Learning Goal:
- To be able to estimate.

Success Criteria:
- Determine a value that is too low and give reasons
- Determine a value that is too high and give reasons
- Determine a value which I believe is just right and give reasons.

Overview of activity:
- Teacher to visit www.estimation180.com and project the website
- Visit Day 1

- For each day, get students to record an answer for ‘Too low’, ‘Too high’, and ‘My guess’
- Ask a few students what they wrote for each section and for them to justify why the put that number in.
- Once all students have written down their estimations for each question, click the ‘check answer’ button.
- Students to calculate how far off their guess was from the actual answer (their error).
- Do 5 days and get students to total their errors.

Extensions/ Other things to consider:
- Create a google sheet like the one that can be seen by visiting http://bit.do/estimate180spreadsheet and get students to use formulas to perform the calculations.
- Do no more than 5 days at a time and spread the 180 days over the course of 1 year.



Which One Doesn't Belong?

Equipment Needed:
Teacher:
- Laptop
- Projector

Students:
- Pen/pencil
- paper

Learning Goal:
- To be able to look for patterns

Success Criteria:
- Determine common attributes for a set of things.
- Determine different attributes for a set of things.
- Explain the similarities and differences between a set of things.

Overview of activity:
- Teacher to visit http://wodb.ca/index.html and project the website
- Visit one of 'shapes', 'number', 'graphs', or 'incomplete sets'.
- Choose one of the sets of 4 and get students to determine which part does not

belong. Note* There can be a case made for each one of the 4 parts in each set not belonging.
- Try and get students to make a case for each of the 4 parts not belonging.
- Get students to share their responses.

Extensions/ Other things to consider:
- Have a look through the website and try and choose a set which is relevant to what you will be covering in class that day.
- There are endless possible correct answers. As students tell you these, write them up on the board with their name next to it. Once you have gone through all 4 parts, get the class to decide which are the strongest responses for each of the 4 parts.

Guess my number

Equipment Needed:
Teacher:
- Piece of paper and a pen

Students:
- Pen/pencil
- Paper
- Or, mini whiteboards with whiteboard markers

Learning Goal:
- To be able to guess, check and improve to determine an answer.

Success Criteria:
- Listen and make notes
- Write down possible answers.
- Check these systematically against the clues.

Overview of activity:
- Teacher to write down a number on a piece of paper.
- They then provide clues to the students. For example:
  "My number has 2 digits",

"the second digit is a prime number",
"the 2 digits are in descending order",
"the product of my 2 digits is 12",
"my number is an even number."

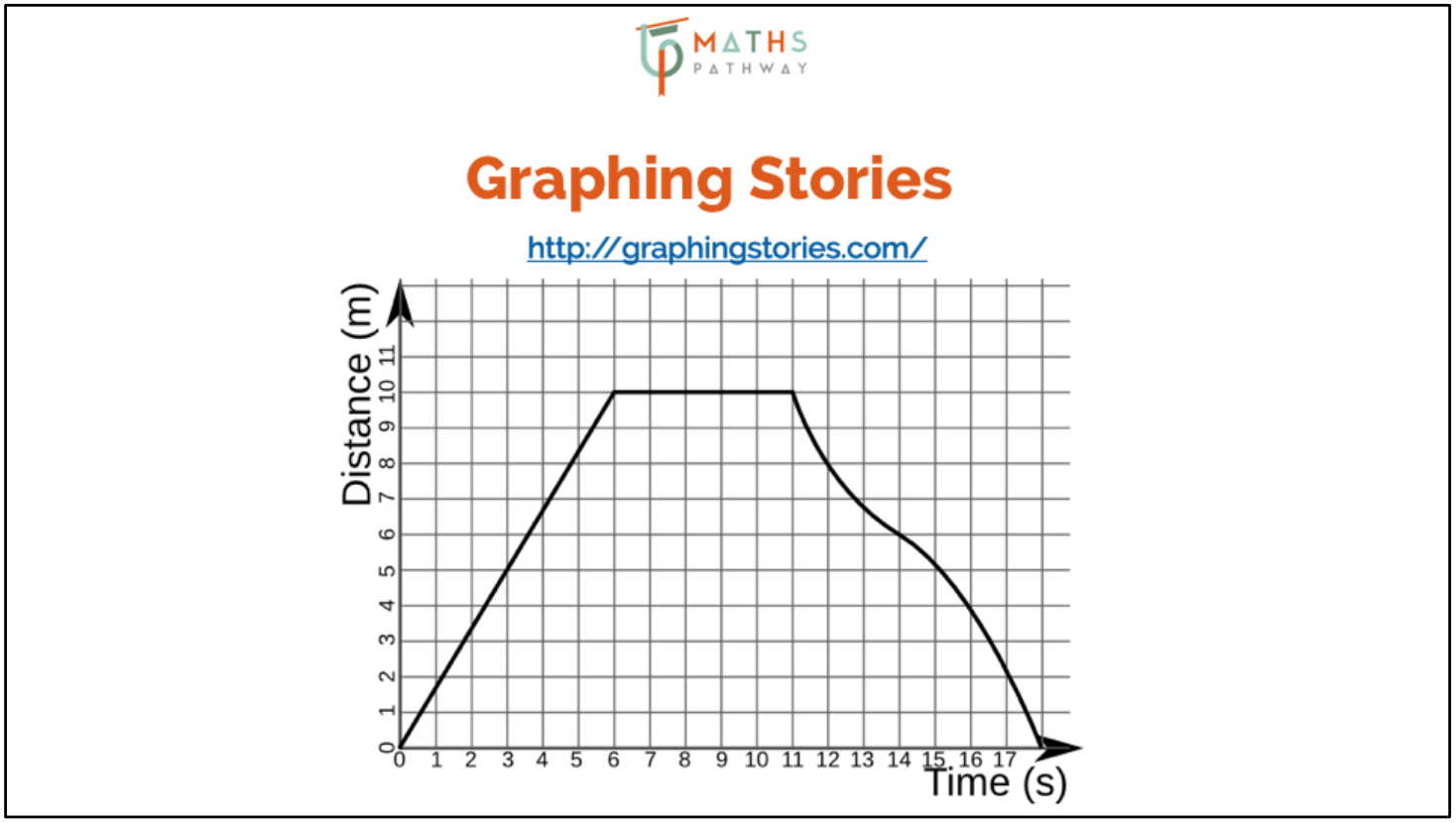
- Keep going with clues, until most students seem to have an answer. You will find that students who get the answer quickly use the later clues to reaffirm that they are correct. This builds confidence.
- Towards the end of giving clues, let the students know how many clues you will give them.
- Make the clues even more obvious for the last few students to get it.
- Then say the answer (in the case above, the answer is 62).

Extensions/ Other things to consider:

- If students seem to think that they have the answer, ask them questions like

Teacher:"Jack, if I add both digits together, what answer will I get?"
Jack: "8"
Teacher: "That is correct, I will get 8"

- Change the game to What am I? To also include shapes, graphs and other mathematical concepts.



Graphing Stories

Equipment Needed:
Teacher:
- Laptop
- Projector
- 1x copy of graph paper printed for each student. See appendix 3

Students:
- Pen/pencil
- Graphing stories axes (see appendix 3)

Learning Goal:
- To be able to graph motion on a Cartesian plane

Success Criteria:
- Identify the independent variable
- Identify the dependent variable
- Correctly label the axes
- Plot the graph so that it looks similar to what is shown in the answer

Overview of activity:
- Hand out the graphing stories axes (appendix 3) to each of your students

- Visit http://graphingstories.com/
- Choose a video and follow the prompts.

Extensions/ Other things to consider:

- Watch the video and try it before entering the class. This will also help with :
    - Choosing something that is at the right level for your students.
    - Aligning the videos with the topics that you are teaching.
    - Determining any issues that might arise, or difficulties your students may have.
- To make it easier, stop the video after every 2 seconds and allow students to plot the points.
- It is worth going through the regular speed and the slow motion shots a couple of times for some of the videos.
- Once students have seen the answers, get them to discuss what parts of the graph they find interesting, and why these parts occur.