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| **Solving maths problems** | | | |
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| Using a number balance see-saw | | | |
| **Subject(s):** Maths, design and technology  **Approx. time:** 40 - 60 minutes | |  | **Key words / Topics:**   * Number 1-20 * Balance * Problem solving * Addition * Add * Subtraction * Take away |
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| **Suggested Learning Outcomes** | |  |  |
| * To be able to solve one-step problems that involve addition and subtraction. * To be able to make a see-saw model and solve practical balance number problems. | | | |
| **Introduction** | |  |  |
| This is one of a set of resources developed to support the teaching of maths in the primary national curriculum. Additionally, this supports design and technology, due to making and the use of a card net. This resource focusses on developing understanding of the use of addition and subtraction to balance a model see-saw.  **Purpose of this activity**  In this activity learners will improve their addition and subtraction skills through a practical approach. They will use a model of a see-saw to balance a range of numbers. Learners will decide how many items need to be added or subtracted to bring the see-saw into balance.  This activity could be used as a main lesson activity, to teach learners how to make a model see-saw and solve number problems using the prompts in the teacher presentation | | | |
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| **Activity** | |  | **Teacher notes** |
| **Introduction (5 minutes)**  Teacher to explain that learners are going to solve some number problems by making and using a see-saw.  **Making the boxes (20-25 minutes)**  Teacher to refresh the safe use of scissors, if required, and demonstrate the steps shown in the presentation to make the thin card boxes:   * Cut out 2 box templates * Fold and crease the fold lines * Cut the corner lines * Fold up the box sides * Glue the tabs using a glue stick.   Teacher to hand out equipment needed for the task and learners make their own boxes.  **Making the See-Saw (5-15 minutes)**  Teacher to demonstrate the steps shown in the presentation how to make the see-saw:   * Secure the bull-dog clip to the table using sticky tack. * Balance a ruler on the bull-dog clip and keep it in place with an elastic band. * Sticky tack the boxes on either end of the ruler to make the see-saw.   **See-Saw activity (5-10 minutes)**  Teacher to demonstrate how to place a bigger number of coins/marbles in one box of the see-saw and a smaller amount on the other box, then work out either to add extra items or take them away to get the see-saw to balance.  Learners to then carry out their own investigations in their pairs or groups.  **Plenary (5 minutes)**  Teacher to check understanding by using number problems in the presentation. | |  | This activity needs to be carried out in pairs or small groups.  **Mad Maths See-Saw** **box** **activity**  The cut lines are represented by solid lines, and the fold lines are represented by dashed lines. It may assist to achieve accurate folds if this is done using the edge of the ruler. Sticky tape could be used as an alternative to glue sticks.  As an alternative to making the box from a net, disposable cups could be used.  **Making the See-Saw activity**  Ensure the bull-dog clip is the triangular type with foldable clips. Wrap the elastic band over the ruler and through the bull-dog clip for a secure hold. Some learners may need assistance with the elastic band. Ensure that all the see-saws are balanced before the start of the activity and safely secured.  If bulldog clips are not available, any suitable triangular shape (such as building blocks) could be used to make the pivot.  **See-Saw activity**  Explain to the learners that addition or subtraction can be used to solve the see-saw number problem. In their pairs or groups one student should decide how many items should be placed into each of the see-saw boxes – the numbers in each container must be different. The other learners should then discuss how to balance the see-saw using either addition or subtraction.  The items in the boxes could be coins, marbles or building blocks.  **Plenary**  The presentation can be edited to increase the number of questions or change the values stated. |
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| **Differentiation** | |  |  |
| **Basic** | |  | **Extension** |
| Provide a template for the boxes pre-cut or use disposable cups as an alternative  . | |  | Learners then create their own problems to solve. They could also try balancing dissimilar items, working out their comparative values.  Play the Karate cats maths game at **BBC Bitesize** <https://www.bbc.co.uk/bitesize/topics/zjkphbk/articles/zf4sscw> |
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| **Resources** | |  | **Required files** icon-docicon-pdficon-ppt |
| * A4 thin card for boxes * Rulers * Bull dog clips (triangular type) * Elastic bands * Marbles or coins * Sticky tack * Scissors * Glue stick * Sticky tape | |  | Solving maths problems presentation  icon-pdf    Solving maths problems box template handout |
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| **Additional websites** | |  |  |
| * **BBC Bitesize** – Addition and subtraction with coins: <https://www.bbc.co.uk/bitesize/clips/z86pvcw> * **BBC Bitesize** – Game: Karate cats maths <https://www.bbc.co.uk/bitesize/topics/zjkphbk/articles/zf4sscw> | | | |
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| **Related activities (to build a full lesson)** | |  |  |
| **Starters** (Options)   * Watch the video; **BBC Bitesize** – Addition and subtraction with coins: <https://www.bbc.co.uk/bitesize/clips/z86pvcw> | **Extension** (Options)   * Learners then create their own problems to solve. They could also try balancing dissimilar items, working out their comparative values. * Play the Karate cats maths game at **BBC Bitesize** <https://www.bbc.co.uk/bitesize/topics/zjkphbk/articles/zf4sscw>   **Plenary**   * Check understanding by using number problems in the presentation. | | |
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| **The Engineering Context** film |
| * Engineers use problem solving each day to work out solutions to various problems. For example, when planning how much cargo could be loaded onto a rocket to a space station, an aerospace systems engineer will add or subtract items so that the cargo is the correct weight. |

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| **Curriculum links** | |
| **England: National Curriculum**  KS1 Maths  Number addition and subtraction.   * solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = - 9. | **Northern Ireland Curriculum**  KS1 – Mathematics and Numeracy  Number:   * investigate the relationship between addition and subtraction in practical situations. |
| **Scotland: Curriculum for Excellence**  Numeracy and Mathematics  Number and number processes.   * MNU 0-03a | **Wales: National Curriculum**  Mathematical Development  Use number skills:   * solve one-step problems that involve addition and subtraction, including missing number problems, e.g. 7 + = 9, using concrete objects and pictorial representations. |
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| **Assessment opportunities** | | |
| * Informal teacher assessment of the activity through observing the task, Q&A and responses to the plenary. | | |
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