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| **Rocket Countdown Maths Game** | | |
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| Maths activity to use balloon rockets and learn integers. | | |
| **Stay safe** | | |
| Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:    • ensuring that any equipment used for this activity is in good working condition  • behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others    Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠ | | |
| **Subject(s):** Maths  **Approx time:** 25 – 35 minutes |  | **Key words / Topics:**   * James Webb Space Telescope * Count down * Counting back * Numbers 0-50 * Integers |
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| **Suggested learning outcomes** | | |
| * To be able to count backwards from numbers up to 50. * To be able to count backwards in steps of 1s, 2s, 3s, 5s and 10s. | | |
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| **Introduction** | | |
| This is one of a set of resources developed with the theme of the James Webb Space Telescope (JWST) to support the teaching of the primary national curriculum. They are designed to support the delivery of key topics within maths and science. This resource focuses on number and the ability to count backwards to zero using different number intervals.  The James Webb Space Telescope (JWST) will be the largest, most powerful telescope ever launched into space. It follows in the footsteps of the Hubble Space Telescope as the next great space science observatory, designed to answer outstanding questions about the Universe and to make breakthrough discoveries in all fields of astronomy.  The JWST will reveal the hidden Universe to our eyes: stars shrouded in clouds of dust, molecules in the atmospheres of other worlds, and light from the first stars and galaxies. With its suite of state-of-the-art instruments, it will push the frontiers of our knowledge of the Solar System, of how stars and planets form, and of galaxy formation and evolution, in new ways.  The telescope will launch on an Ariane 5 rocket from Europe’s Spaceport in French Guiana. From there it embarks on a month-long journey to its destination orbit around the second Lagrange point (L2), about one and a half million kilometres from Earth. In the first month after launch, Webb will unfold its sunshield, which is the size of a tennis court, and then deploy its 6.5-metre primary mirror that can detect the faint light of distant stars and galaxies with a sensitivity a hundred times greater than that of Hubble. | | |
| **Purpose of this activity** | | |
| This resource uses the context of counting down for a rocket launch to learn and practice counting backwards.  In this activity learners will to countdown backwards using different steps i.e. 1s, 2s, 3s, 5s and 10s. This will prepare learners to count to and across to 100, forwards and backwards, beginning with zero, or from any given number. To enhance engagement, learners will release balloon ‘rockets’ when each countdown reaches zero.  This activity could be used as a main lesson activity, to teach learners how to count backwards 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 count backwards to zero from several starting points between 0-50. When they reach zero, learners will release balloons like rockets.  **Countdown activity (15-20 minutes)**  Give out a balloon to each learner and let them blow it up. Learners should hold the balloons once inflated or attach clips to stop premature launch.  Teacher to use the teacher presentation and follow the prompts to count down in steps of 1s, 2s, 3s, 5s, and 10s. As each count down reaches zero the balloon rocket will be released.  **Discussing the results of the activity (5-10 minutes)**  Teacher to check learner’s knowledge of the counting back by making the connection that counting back is subtraction. As they count back, they are taking away the step number each time. |  | This activity could be carried out as whole class or in small groups.  When using the presentation, you are prompted with which step to use for the countdown and with a starting number. As you click through the steps each number, in sequence, will be revealed and at zero the balloon will be launched.  When using balloons, ensure that no learners have a latex allergy and protect any asthmatics by using a balloon pump. Some younger learners struggle with blowing up balloons, so some could be inflated prior to the lesson and ‘tied-off’ using clips. As the balloons are released when the count reaches zero, the balloons should not be tied.  If re-inflation is not possible within the time, a proportion of the balloons could be released each time – e.g. a certain colour or all the balloons from one table group, etc. |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| A number line could be positioned in the classroom for reference. |  | Start the count downs from 100 or count down using other integers.  Choose a random number and allow the learners to work out the steps to count down to zero. |
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Whiteboards * Whiteboard markers and erasers * Pack of balloons * Balloon pump |  | icon-ppt Rocket Countdown Maths Game presentation |
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| **Additional websites** |  |  |
| * **BBC Bitesize** – Counting back: <https://www.bbc.co.uk/bitesize/clips/zdxpvcw> * **YouTube** – Ten green bottles: <https://www.youtube.com/watch?v=T0ooQv7oHvw> | | |
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| **Related activities (to build a full lesson)** |  | |  |
| **Starters** (Options)   * Show the video: **BBC Bitesize** – Counting back: <https://www.bbc.co.uk/bitesize/clips/zdxpvcw> * Sing a counting down song as a class (such as 10 green bottles using the link in the additional websites). * **NASA on the** [James Webb Space Telescope](https://www.youtube.com/watch?v=6VqG3Jazrfs) * **Intro facts (3 minutes)** [to inspire the next generation](https://www.youtube.com/watch?v=D8TRoLImYUY) | | **Extension** (Options)   * Start the count downs from 100 or count down using other integers * Choose a random number and allow the learners to work out the steps to count down to zero.   **Plenary**   * Discuss the activity and how the counting down links with subtraction. | |
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| **The Engineering Context** film |
| An understanding of number combinations and number operations is vital for engineers who need to solve lots of interesting problems. For example, electronic engineers use countdown timers to let motorists know when a traffic light will go from red to green and allow the motorist to drive off safely. |

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| **Curriculum links** | |
| **England: National Curriculum**  KS1 Maths   * count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. * count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens. | **Northern Ireland Curriculum**  KS1 – Mathematics and Numeracy  Number:   * count, read, write and order whole numbers, initially to 10, progressing to at least 1000. |
| **Scotland: Curriculum for Excellence**  Numeracy and Mathematics  Number and number processes:   * MNU 0-02a * MNU 0-03a | **Wales: National Curriculum**  Mathematical Development  Use number facts and relationships:   * recite numbers up to 100, forwards and backwards and from different starting points. * count in 2s, 10s and 5s to 100. |
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| **Assessment opportunities** | | |
| * Informal teacher assessment of the counting back. | | |
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