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| **Chinese Zodiac Code Breaker** |
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| Code breaking using math’s calculations |
| **Subject(s):** Mathematics**Approx time:** 30 – 45 minutes |  | **Key words / Topics:** * Chinese New Year
* Calculation
* Addition
* Subtraction
* Multiplication
* Division
* Fraction
* Percentage
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| 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: ⚠ |
| **Suggested Learning Outcomes**  |  |  |
| * To be able to calculate using addition, division, multiplication, addition and subtraction
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| **Introduction** |  |  |
| This is one of a set of resources that use seasonal events or celebrations to allow learners to develop their knowledge and skills in Design & Technology, Engineering and Mathematics. This resource uses the theme of the Chinese zodiac as inspiration for a code breaking activity that reinforces math’s skills. |
| **Purpose of this activity**In this activity learners will carry out maths calculations to break codes based on the zodiac animals of the Chinese New Year.This activity could be used as a main lesson activity to reinforce learners’ basic numeracy in Key Stage 3. It could also be used as part of an introduction to the use of numeracy within engineering. |
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| **Activity** |  | **Teacher notes** |
| **Introduction (5-10 minutes)**Teacher to explain that learners are going to carry out a code breaking mathematics activity based on the zodiac of the Chinese New Year. Teacher to explain when the Chinese New Year is celebrated, what the animals of the zodiac are and their associated traits.**Code breaking activity (20 – 30 minutes)**Learners to complete the code breaking activity sheets.**Plenary (5 minutes)**Learners to discuss their results and what Chinese zodiac names were revealed. |  | Print and distribute the Chinese New Year zodiac activity sheets. Note that the final two pages of the activity sheets have the answers.Learners could try to guess the characteristic traits based on the animal.The animals and their associated traits are:* Rat: Quick-witted, resourceful, versatile, kind
* Ox: Diligent, dependable, strong, determined
* Tiger: Brave, confident, competitive
* Rabbit: Quiet, elegant, kind, responsible
* Dragon: Confident, intelligent, enthusiastic
* Snake: Enigmatic, intelligent, wise
* Horse: Animated, active, energetic
* Goat: Calm, gentle, sympathetic
* Monkey: Sharp, smart, curious
* Rooster: Observant, hardworking, courageous
* Dog: Lovely, honest, prudent
* Pig: Compassionate, generous, diligent

Learners could discuss whether it is fair and reasonable to categorise people with traits in this way. |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| * Provide learners will a part completed formula to allow them to focus on the workings out.
* Visit the BBC Bitesize website to support learner understanding of fractions and percentages.
 |  | * Learners create their own code breaker activities based on different math calculations.
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Writing instruments (pens, pencils, erasers)
* Calculators
 |  | icon-ppt Chinese zodiac code breaker presentationicon-doc Chinese zodiac code breaker handout |
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| **Additional websites** |  |  |
| * **YouTube**: The Chinese zodiac explained (TED talk): <https://www.youtube.com/watch?v=Kxg0_EpOcWs>
* **YouTube**: The myth behind the Chinese zodiac: <https://www.youtube.com/watch?v=may2s9j4RLk>
* **China Travel Guide**: Chinese Zodiac https://www.travelchinaguide.com/intro/social\_customs/zodiac
* **BBC Bitesize** - Introducing fractions: https://www.bbc.co.uk/bitesize/guides/zkjwcmn/revision/1
* **BBC Bitesize** - Introduction to percentages: <https://www.bbc.co.uk/bitesize/guides/zkjwcmn/revision/1>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Watch the video YouTube: The Chinese zodiac explained (TED talk): https://www.youtube.com/watch?v=Kxg0\_EpOcWs
 | **Plenary*** Learners to discuss their results and what Chinese zodiac names were revealed.
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| **The Engineering Context** film |
| Engineers use numeracy skills to solve problems and help then design and create new technologies and products. For example, aircraft engineers use numeracy when making very accurate measurements on turbine blades. |
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| **Curriculum links** |
| **England: National Curriculum****Maths** KS3 – Number* use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers
* interpret fractions and percentages as operators
 |  | **Northern Ireland Curriculum**Maths and numeracy* demonstrate mental mathematical capability with simple problems
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| **Scotland: Curriculum** **Maths****Number and number processes**MNU 3-03a* Solves addition and subtraction problems working with whole numbers and decimal fractions to three decimal places.
* Solves addition and subtraction problems working with integers.
* Solves multiplication and division problems working with whole numbers
 |  | **Wales: National Curriculum** **Maths****Using number skills*** use appropriate strategies for multiplication and division, including application of known facts
* calculate percentages of quantities using non-calculator methods where appropriate
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| **Assessment opportunities** |
| * Formal teacher assessment of the outcomes of the code breaking activities
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