Age 10-11- Find the Difference in Temperatures Lesson- Mars- The Red Planet

Teaching Alive

Suggested Curriculum Links	
England • use negative numbers in context, and calculate intervals across zero	**Scotland** • I can show my understanding of how the number line extends to include numbers less than zero and have investigated how these numbers occur and are used
Wales • add or subtract across zero using a number line, e.g. -3 + 5, 4 − 6 • calculate temperature differences, including those involving temperature rise and fall across 0°C	**Republic of Ireland** • identify positive and negative numbers in context • identify positive and negative numbers on the number line • add simple positive and negative numbers on the number line
Northern Ireland • understand and use negative numbers in context. • develop skills in estimation of length, weight, volume/capacity, time, area and temperature;	**Australia** • Investigate everyday situations that use integers. Locate and represent these numbers on a number line

Notes

- **For support, the on-line version of this lesson is available at Teaching Alive.**
- Marking is available in TC65M.2.2.
- Suggested curriculum links highlighted in green are differentiated objectives from a future years' curriculum.
- When modelling examples, questions designated by E are designed for learners to copy into books or on paper to set presentation expectations and support different styles of learning.
- In the investigation option, the rules for adding and subtracting positive and negative numbers are: Two like signs become a positive sign and two unlike signs become a negative sign.
- **If animations are available, click on the Scene link in the PowerPoint to view. Images are provided (see PP65M.2.5) as an alternative and can used to re-cap.**
- Plans and PowerPoints are detailed and thorough to provide teaching structure, if needed, for the whole or parts of the lesson. An alternative streamlined PowerPoint is also provided- PP65M.2.6Stream.

Optional Lesson Prep

If this Maths unit is being taught separately from our writing unit, or if this lesson is being taught before the writing lesson, then provide context by watching Literacy Scene 01 (PP65M.2.4-Slide 2 or/and discuss images PP65M.2.5) which shows a shuttle take off from the point of view of an astronaut. Who would want to be an astronaut? Why? Where do you think they are flying? Why? Do you agree with space exploration? Do you know any space facts? Explain that we are travelling to Mars and watch Literacy Scene 02 (PP65M.2.4-Slide 3 or/and discuss images PP65M.2.5). Discuss the journey looking at a diagram of our solar system (PP65M.2.4-Slide 4). Watch Literacy Scene 03 (PP65M.2.4-Slide 5 or/and discuss images PP65M.2.5) and ask learners to describe their thoughts and feelings as they stepped on to Mars. Explain we have landed on Mars to investigate the possibility of life. We need to take measurements and study the soil. Watch Maths Scene 01 (PP65M.2.4-Slide 6 or/and discuss images PP65M.2.5), which shows an astronaut experimenting and taking temperatures on Mars, to provide further context.

Investigation Option*	IT Option*	
HA Recap steps to success and answers from talk time in the introduction. Explain adding and subtracting negative numbers in the context of balloons and weights. Use PC65M.2.6 and go through step by step as a group concluding and generating new steps to success and actions (PP65M.2.3 Slides 2-23 & TC65M.2.1). Challenge children to answer questions from board using steps (PP65M.2.3 Slide 22).	**LA/LMA/MA** • BBC Teach Video • MathsFrame NNS Thermometer ITP • MathsisFun thermometer- Relating temperatures to life • Topmarks Temperature- Reading and difference	**HA** • MathisFun Adding and Subtracting Positive Numbers • MathsisFun Interactive Thermometer- Celsius to Farenheit

*IT option links are provided as a convenience and for educational/informational purposes only; they do not constitute an endorsement or an approval of any of the products, services or opinions of the corporation or organisation or individual. We bear no responsibility for the accuracy, legality or content of the external site or for that of subsequent links. Contact the external site for answers to questions regarding its content. If any links do not suit the learning objective or do not work, please contact us at enquiries@ teachingalive.co.uk.

Learning Objective	Steps to Success				
To find the difference between temperatures on Mars	1. I can find the find the difference between temperatures • Number line- coldest first, hottest second • Ten or zero	• Jump to ten or zero- How many? • Jump to hottest- How many? • Add jumps	2. I can understand adding and subtracting negative and positive numbers • If they're the same, then add	• If they're different, then subtract	

Starter (10 mins)

• Key questions to last lesson's Assessment Group (LMA) to reflect on learning. (PP65M.2.1-Slide 2)

Talk Time (Grouped Pairs)

• Watch Scene 02 which shows an astronaut being stranded on Mars (PP65M.2.1-Slide 3 or/and discuss images PP65M.2.5). What has happened? What should his/her first priorities be? Discuss how our problem has changed because we are stranded. (PP65M.2.1-Slides 4-6)

Main (20 mins) | Groups (25 mins)

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• Introduce our learning objective and the first part of a problem to find temperature differences on Mars (PP65M.2.1-Slide 7-8).
• Model the simple steps of counting on, using a number line and positive temperatures from 0 to 20. Establish steps to success and actions using counting aids for LA (PP65M.2.1-Slides 9-10 & TC65M.2.1).
• Move on to negative numbers starting with the lowest number, adding on to zero as a positive number and then adding on to the higher number, amending and repeating steps to success with actions (PP65M.2.1-Slide 11 & TC65M.2.1). Look at more examples repeating steps and actions (PP65M.2.1-Slides 12-13).

Talk Time (Grouped Pairs)

• Print out PP65M.2.1-Slide 15 and give instructions for Group C to draw their own number lines in pairs and find the difference with larger numbers by counting on. Challenge each other with three and then investigate adding and subtracting positive numbers.
• Ask Group B to count on with numbers from -10 to +10 on number lines, inventing their own questions if finished (PP65M.2.1-Slide 16).
• Assess Group A using PP65M.2.1-Slide 16 or print PP65M.2.1-Slide 17 and support.
• Check answers for Group A and B (answers for Group C can be discussed during their activity) (PP65M.2.1-Slides 18-19).

• Recap steps to success and activities for groups including actions (see TC65M.2.1). Explain that Group C may look at understanding adding and subtracting negative and positive numbers using balloons and weights. (PP65M.2.1-Slides 20-24)

Groups (25 mins)

LA (Group A)
Find differences in temperature from 0 to 20 using a number line as support (PC65M.2.1).
Ext– Invent own or differences from -13 to +13 (PC55M.2.2).

LMA (Group B)
Find differences in temperatures from -13 to +13 using a number line as support (PC65M.2.2).
Ext– Differences from -53 to +53 (PC65M.2.3).

MA (Group B)
Find differences in temperatures from -13 to +13 or -53 to +53 using a number line as support. (PC65M.2.2 or PC65M.2.3).
Ext– Increases and decreases with support (PP65M.2.3-Slides 2-7 & PC65M.2.4).

HA (Group C)
Understanding adding and subtracting negative numbers (see Investigation Option).
Ext – Problems involving differences and increases/decreases (PP65M.2.3 Slides 8-10 & PC65M.2.5).

Plenary (5 mins) | Assessment Group | Resources | VAK

Plenary (5 mins)	Assessment Group	Resources		VAK	
• Two chdn stand back-to-back. Call out a number and a number to be increased or decreased crossing over zero. Winner shouts the answer and "splat" and turns and splats an imaginary pie. (PP65M.2.1-Slides 25-32) • Self-assessment (PP65M.2.1-Slides 33-34)	**HA** • Support with investigation. • Challenge to add and subtract negative numbers independently.	PP65M.2.1NegDif PP65M.2.2AddSub PP65M.2.3NegExtra PP65M.2.4Prep PP65M.2.5Images PP65M.2.6Stream PC65M.2.1Count	PC65M.2.2NegDiff PC65M.2.3NegDiff PC65M.2.4NegIncDec PC65M.2.5NegProb PC65M.2.6AddSub TC65M.2.1Act TC65M.2.2Mark	**Focus: Visual** **Visual** Use of animation, arrows, frog/lily pad images and number lines.	**Auditory** Count aloud and repeat steps to success in process. Discussion in talk time. **Kinaesthetic** Use of jumps and fingers to support LA with finding the difference and increases/decreases. Talk time for learners to have a go.