Curious Minds/ESERO Framework for Inquiry

THEME	A Journey into Space	
CURRICULUM	**Strand:**	Energy & Forces; Materials
	Strand Unit:	Forces, Mixing and other changes, Properties and characteristics of materials
	Curriculum Objectives:	• Identify and explore how objects and materials may be moved • Come to appreciate that gravity is a force • Explore some simple ways in which materials may be separated • Describe and compare materials • Group material according to their properties • Investigate how materials may be used in construction • Observe and investigate the movement of objects such as toys on various materials and surfaces
	Maths:	Solve and complete practical tasks and problems involving 2-D and 3-D shapes. Estimate, measure and record length using metre and centimetre. Estimate, measure and construct angles in degrees. Collect, organise and represent data using pictograms, single and multiple bar charts and simple pie charts.
	Skills Development - Working Scientifically:	Working Scientifically: Questioning; Investigating & Experimenting; Analysing. **Designing and Making:** Exploring; Planning; Making; Evaluating.

ENGAGE

THE TRIGGER	WONDERING	EXPLORING
• Photograph of outer space or the far side of the moon. • Purifying water on the ISS • Launch of Vega (first minute of video) • Beagle Lander found on Mars (link)	• I wonder what life is like in outer space? • How would I get there? How do we explore other planets? • How would I survive? How do the astronauts 'recycle' their water? • How do I get around when I am there? What are my constraints? How can we design a vehicle to cross difficult terrain? • Can we make models of rockets / space buggies to find out how they work?	• Explore a selection of pre-made rockets (Make a rocket, Design and make a paper rocket, Rocket launch, Design and make a foam rocket). Explore how each one is launched. • Discuss all the different ways we use water in the home and at school? Do you know how much water the average person uses a day? • Explore how a moving vehicle can move when it has a full load compared to when it is empty. • Explore how it moves over different surfaces

Considerations for inclusion

Consider potential area of difficulty for students with Special Educational Needs.

INVESTIGATION 1 – DESIGN AND MAKE A FOAM ROCKET

STARTER QUESTION	PREDICTING	CONDUCTING THE INVESTIGATION	SHARING: INTERPRETING THE DATA / RESULTS
• How does the force at launch affect how far the rocket goes? or • How does angle of launch affect how far the rocket goes?	• What do you think about how the objects fell?	• Examine a pre-made foam rocket and use it to carry out the investigation. Outdoors can be used if the wind is calm. A large indoor space is an alternative.	• Did anything unexpected happen? • Discuss: did any of the objects go up in the air? • Did any of the objects stay up in the air? Or did they all fall to the ground?

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INVESTIGATION 2 – CAN YOU LIVE ON MARS? (ESERO) / CLEANING DIRTY WATER

STARTER QUESTION	PREDICTING	CONDUCTING THE INVESTIGATION	SHARING: INTERPRETING THE DATA / RESULTS
• How do the astronauts purify their water in space? • Look at the Chris Hadfield clip.	• Allow the children to discuss and predict different methods they think the astronauts use to purify and recycle their water.	• Working in groups the children will begin the purifying process. Initially they will remove the solid dirt from their mixture. After this they will remove the invisible substances and finally they will remove limescale and germs.	• Record the volume of water remaining after the 'purifying process'. • Present your findings on a chart.

INVESTIGATION 3 – THE TRAVELLING SPACE BUGGY (ESERO)

STARTER QUESTION	PREDICTING	CONDUCTING THE INVESTIGATION	SHARING: INTERPRETING THE DATA / RESULTS
• How can a space buggy be designed to be stable and travel easily over bumpy ground?	• Predict by drawing the design of a buggy that students think will be stable / travel easily using the equipment provided. Wheel size and location are likely variables.	• Make the buggy as designed. Test for stability / ease of travel. • Re-design as needed.	• How are the buggies the same? • How are they different? • What makes the best buggy? • What do we mean by 'best'?

TAKE THE NEXT STEP

APPLYING LEARNING	MAKING CONNECTIONS	THOUGHTFUL ACTIONS

- Discuss student findings.
- Consider how to extend student knowledge/findings into further learning situations or investigations
  - Examples: Where does the water in your home come from? How was this rocket like/unlike other/real rockets? Is this vehicle suitable for all terrains? Do all vehicles have 4 wheels?
- Apply learning into other subjects - see back page of this booklet for some cross-curricular ideas.

REFLECTION	• Did I meet my learning objectives? • What went well, what would I change? • Were the cross curriculum opportunities used? • Are the children progressing with their science skills? • Have you recorded and reviewed any new vocabulary? • What questions worked very well? • What questions didn't work well? • Ask the children would they change anything or do anything differently.

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