






Exoworlds

Keywords	Level	Time	Core Skills	Type of Activity
				
Scales Planets Light Solar System Habitable Zone	Junior Cycle	1h 15 min	Modelling Inquiry activity	Hands-on Science

Brief Description



ESA's CHEOPS spacecraft will look at stars beyond the solar system to discover more about their planets.

Students will compare different extra-solar systems to our solar system and learn how scientists hunt for exoplanets. Students will consider the factors that determine the habitable zone around a star. Students will model the transit method of spotting exoplanets and investigate the factors that affect the type of planets that we are able to find.

Learning Objectives and Curricular Links



Earth and Space 1: describe the relationships between various celestial objects including moons, asteroids, comets, planets, stars, solar systems, galaxies and space




Physical World 3: investigate patterns and relationships between physical observables

Nature of Science 3 and 4 : ...design, plan and conduct investigations... / ...critically analyse data to identify patterns and relationships...

Materials



till roll paper
pencils
metre sticks
Planet information cards
light meters
lamps
model planets

	<p>Background Information / Skills required</p>
	<p>Summary Activity Description</p>
	<p>This activity uses a range of scientific and mathematical skills. Students will be making different scale models of the solar system and newly discovered ExoWorld solar systems. Students will carry out fair tests while modelling ExoWorld transits and measure light curves during model transits. Students should be able to identify variables and create fair tests.</p> <ol style="list-style-type: none"> 1. Planets in our Solar System – review of students’ knowledge and understanding 2. Planets in other Solar Systems – students will select and compare information about another solar system, the Trappist-1A system. 3. Scales and models to compare solar systems – students will compare two different solar systems in terms of scale and size and consider factors that affect the habitable zone around each star. 4. Detecting Light – students will use a light meter. 5. Modelling transits – students will design and carry out fair tests to investigate what factors affect the measurement of transit of a model planet around a model star. 6. Evaluating models – students will compare the physical model to ICT models of transits.
	<p>Additional Information / Follow on Activities</p>
	<p>ESA’s CHEOPS model can be downloaded here: http://sci.esa.int/cheops/59851-cheops-paper-model/</p> <p>The main CHEOPS site is here: http://sci.esa.int/cheops/</p> <p>Video about Astrobiology and the chance of life elsewhere is here: https://vimeo.com/54928358</p> <p>Explore ExoPlanets with NASA’s site: https://exoplanets.nasa.gov/alien-worlds/</p> <p>All Exoplanets are listed at http://exoplanet.eu/catalog/ this can be used as a source of data for a data processing activity on the sizes of exoplanets and their distances from their stars.</p>