# Exploring Space and planets using AR

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Subject: **-Mathematics -Physics -Geometry**
Name of the School: **AL MOHAMMADIA**
Grades levels: **6-8**

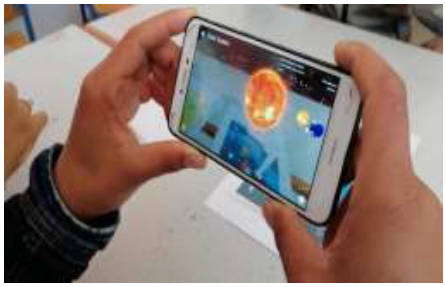
**Duration of Lesson/Activity**: 30-60 Minutes

## Purpose:

In this lesson, students will use Augmented reality with CleverBooks Space App to explore the breath taking planets around our solar system and discover the tools and technology behind the future of space exploration.

## Learning Objectives:

At the end of this lesson, students should be able to:



- Explore the solar system.
- Identify and assemble SpaceX rockets.
- Watch the exhilaration SpaceX rockets launch into space.
- Fly through the Earth's atmosphere layers.
- View witness the separation of the first and second stages during fight
- See the delivery of payload to specified destinations.

## Resources /Materials:

- CleverBooks Space App.
- Projector for group interaction.
- Mobile device: Tablet or Mobile phone based on Android or Apple.
- Physical space-marker image

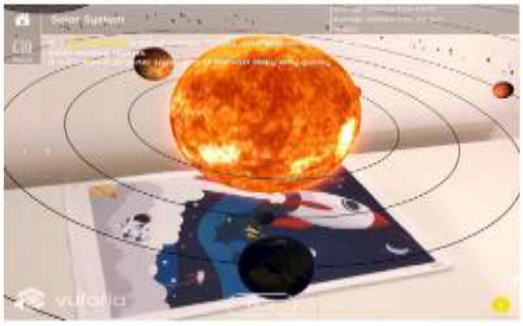
## Before the Activity: How do you start using the Space CleverBooks App with AR?

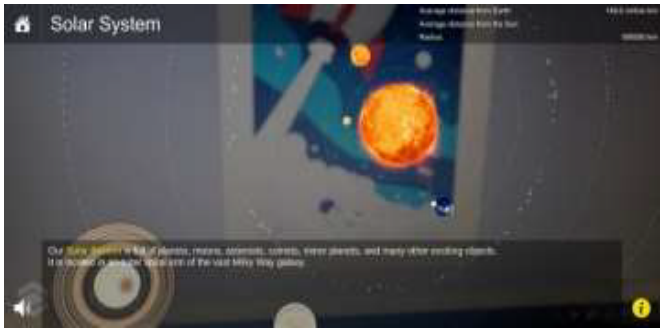
1. Have the physical space-marker image from CleverBooks.

2. Download the free Space App, from the Apple App Store for iOS or Google Play for Android devices.
3. Launch the App and choose between: Solar System, Rocket Info, Rocket Puzzle, and Rocket Launch modes.
4. Once the App is launched, face the camera of your mobile device on the physical image to have the full experience of each mode with AR.

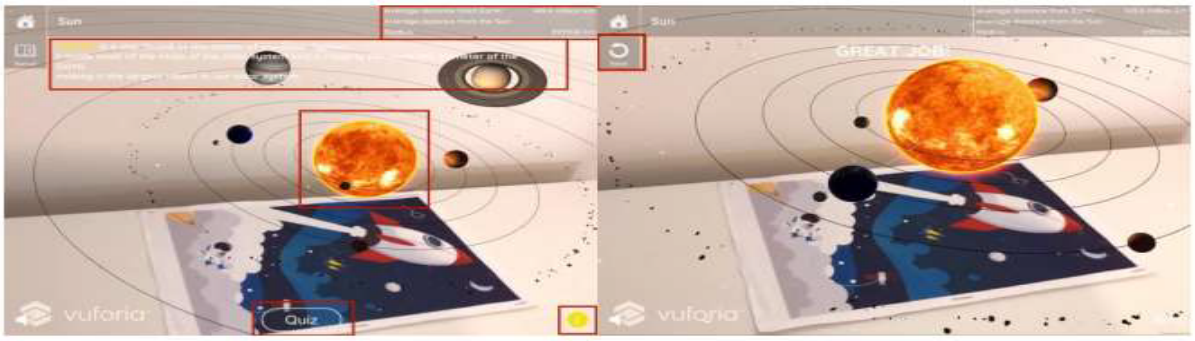
## Activity -1: Explore and take a short quiz about the solar system

- This mode contains objects in the solar system (**planets**, **moon**, **asteroids**, **and** the **Sun**).





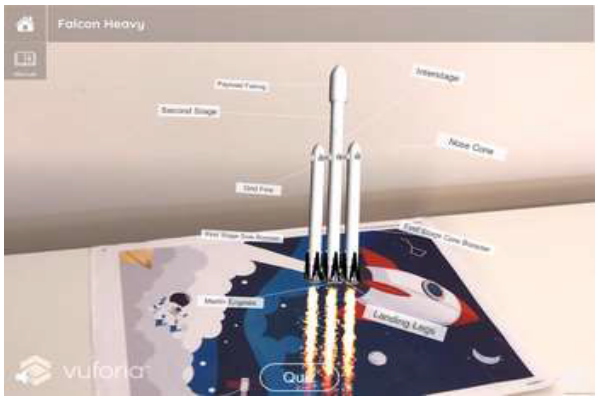

- Zoom in and out (PINCH with multiple fingers) to take a closer look at the planets.
- Select (TAP on screen) each planet to interact and get information about them.

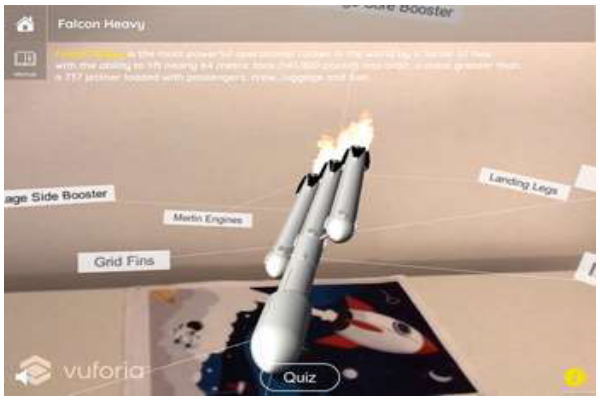



- Start the short quiz, by pressing the "Quiz" button

## Activity- 2: Examine SpaceX rockets and take a short quiz about the rocket's parts

- There are two rockets available in this mode, SpaceX Falcon 9 and Falcon Heavy.
- Zoom in and out (PINCH with multiple fingers) to take a closer look at the rocket. Rotate (SWIPE the screen) the rocket around to get a different viewpoint.



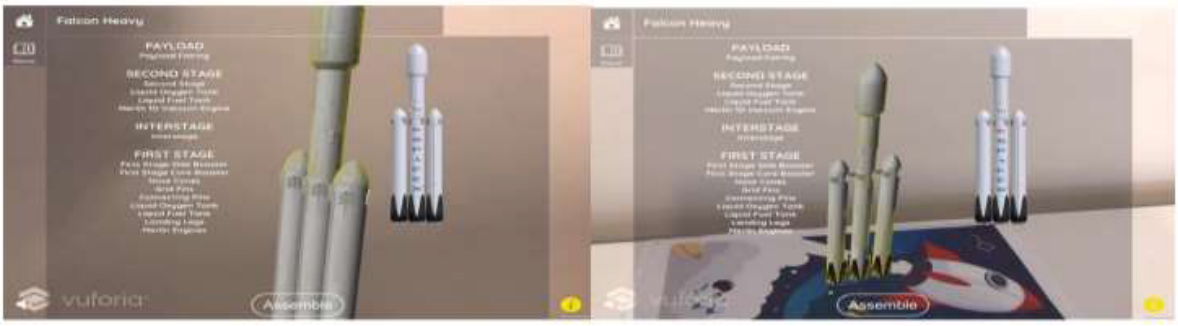




- Select (TAP on screen) a rocket part or 3D text to interact and get information about the part.
- When you're ready to test your knowledge about the rocket, select (TAP) the "Quiz" button to start the quiz.

## Activity 3: Assembling SpaceX rockets

The goal is to assemble the rocket correctly by placing each rocket part in their correct slot.

- Zoom in and out (PINCH with multiple fingers) to take a closer look at the rocket. Spin (SWIPE the screen) the rocket around to see it from a different viewpoint.



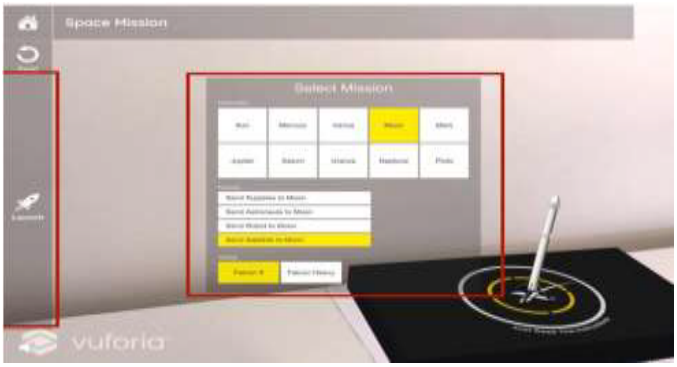

- Move (TOUCH DRAG on screen) each rocket part and see where it is positioned on the rocket.
- When you're ready, press "Assemble" to start assembling the rocket, moving each part to their correct position.


## Activity - 4: Creating your own space flight mission to other planets.

- Students will now be able to see the rocket fly through the Earth's atmosphere layers.
- There are two rockets (SpaceX Falcon 9 and Falcon Heavy) available and 4 different payloads (Supplies, Astronauts, Robot, and Satellite) to send to space.
- A camera will appear, showing how high the rocket is from the earth surface.


- Zoom in and out (PINCH with multiple fingers) to take a closer look at the scene (droneship, planets and rocket).
- Rotate (SWIPE the screen) the scene to get a different angle of all the objects in the scene.

- When you're ready, select "***Mission***" to create your own space mission.
- To create your own **mission**, simply choose one from each category: destination, payload, vehicle.
- Select the destination planet, choose the desired payload to send and the vehicle to use.
- Press "**Launch**" to launch the rocket to its destination




- The rocket will now fly to its destination, the payload will be dropped and the first stage of the rocket will return back to its landing zone (droneship).
- On completion, press "Reset" to have another go, to create a different mission

## Associated Activities

- Into Space! - Students learn basic physics concepts on how rockets work as they design, build and test model rockets using mobile devices.
- Depending on the age, ability, or understanding of your students, it may be helpful to display the directions and mode to understand.

## Key Vocabulary/Definitions

**Rocket***:* A vehicle that moves by ejecting fuel.

**Payload**: the amount of explosive that a missile carries, or the equipment carried in a spacecraft

**Star***:* A huge burning sphere of gas, made up of roughly 90% hydrogen and 10% helium.

**Asteroids**: are minor planets, especially of the inner Solar System

**Solar System**: is the gravitationally bound system of the Sun and the objects that orbit it, either directly or indirectly.

**Falcon Heavy**: is a partially reusable super heavy-lift launch vehicle designed and manufactured by SpaceX.

## Assessment:

- The teacher can monitor throughout the activities. Students can be given Success Criteria checklists to see that they are understanding the Activities.
- Using additional AR exploration tools, students will provide narration of how we can explore space.
- Students will do the Quiz inside the AR CleverBooks app.
- Does student have an understanding of Vocabulary used?
- The teacher will be able to assess visually whether students are able to identify the parts of Rockets.