



SERIOUS GAMING IN THE CLASSROOM



Planeteers - STEAM Quest Summary - Level 1

Teachers Guide

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

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About.

The Planeteers STEAM Quest Summary provides a guide to the game's introductory quests. The quests aim to develop STEAM skills and identities through project based learning within the construct of the Planeteers game world and simulated environments. The quests are mapped to the learning objectives and outcomes of the STEAM Learning Continuum, and specifically the level 1 pillars and concepts. Initial skill building provides the foundation of background knowledge necessary in order to begin learning skills at the next level. After completing these quests, learners can engage in level 2+ quests, and additionally in sandbox project based learning outside of the game's quest framework.

How to Read the Curriculum

The infographic below illustrates how the quests are organised in a scaffolded fashion according to STEAM pillars and key concepts, mapped to learning objectives. Learners earn experience points (XP) towards badges based on completing quests mapped to key learning objectives.





















MATHEMATICS											
Core Objectives: Demonstrates knowledge of mathematical concepts and skills in investigating, representing and interpreting mathematical problems. Players think analytically and use reason and logic to interrogate, calculate, process, manage and represent data relating to their experience in the world. They collect, classify, and process data in a variety of formats.											
STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Calculating	MC1.1	Calculate solutions to problems using numbers and simple functions	Engineering (Natural & Built Environments)	Tally your building blocks.	Through trial and error, investigate the number of blocks it takes to build your first homebase.	Mission Control wants a full sitrep on how our resources are being used so they can help us plan for enhancements. The professor has asked you to count the number of blocks used so far to construct base camp and record in the journal with photos.	Once you have finished the tally, pick one enhancement for base camp that you might do in the future. Explain why it's important and what it will be used for, then calculate how many blocks you might need for the project. Record your plans in the journal.	Calculator	25%	Components	25%
Data	MD1.1	Design and create tallies based on frequencies	Art (Photography)	Survey the penguin population.	Mission Control wants a survey of the polar penguins. Take a trip and snap some pics of the penguins, then count and record the number you see in the journal.	Penguins are aquatic birds adapted for ocean life. They lay eggs, have feathers, and are powerful swimmers, but cannot fly. The only time penguins are airborne is when they leap out of the water to get a gulp of air before diving back down for fish. Penguins cannot breathe underwater but are able to hold their breath for up to twenty minutes. Woah!	Penguins are social birds that tend to feed, swim, and nest in groups. They mainly eat fish, but also eat other seafood they might catch like crabs and squid! Their funny tuxedo-like appearance is called "countershading," a form of camouflage to help keep them safe in the water from predators like seals and sharks. Eek!	Number Cruncher	25%	Ecosystem 101	25%
Shapes and Representation	MS1.1	Manipulate, sort, describe, various shapes in the environment	Arts (photography) Engineering (Natural and Built Environments)	Take aerial pics of base camp.	Take photos of base camp from the air. Add journal notes about the design of your base and why you have chosen the design you have, the advantages and disadvantages.	Aerial photos are usually taken with a camera mounted on the bottom of a drone or aircraft. An aerial photo allows a whole area to be observed rather than a portion of it. This way we can see survey resources, measure the length of rivers or size of land masses, and see patterns including how things might change over time.	When describing the features in aerial photos sometimes things can seem unfamiliar from high above. Try talking about the size and shapes of objects compared to other photo features. Study and describe the colors too, as they tend to relate to the type and amount of vegetation in the photo.	Patterns	25%	Shapes	25%
Shapes and Representation	MS1.2	Construct simple representations to describe in-game phenomena	Maths (Calculation) Arts (Colour & Style)	Build a polar bear statue.	Find high ground on the polar continent, then use the builder to create a life-like sculpture of a Polar Bear. Texture and paint, then take photos for your journal.	Building a statue seems very fitting for the king of the arctic zone! Polar bears are one of nature's toughest animals and live in the frozen wilds of the Arctic. They are huge! Polar bears can grow 10 feet tall and weigh up to 1500 pounds, making them the largest land-dwelling meat eaters on Earth. Woot!	Polar bears are well adapted for subzero temperatures. Their white fur is actually transparent, allowing the sun to warm their black skin, which is great at capturing the sun's energy to help keep them warm. WHOA! Polar bears have 42 teeth and are the largest carnivore (meat eaters) that lives on land. Seals make up most of the Polar Bears' diet. Yikes!	Art 101	25%	Shapes	25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

SCIENCE

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Core Objectives: Players develop knowledge of natural and man made environment and skills in thinking and working scientifically, and by doing so develop an interest in science as a means of expanding their curiosity and willingness to investigate (explore), query (ask questions) and hypothesise (predict/speculate). Players explore changes in the world around them, including changes that impact on them, e.g. weather, and changes they can effect, e.g. making things move or change shape. Players learn that seeking answers to questions they pose and making observations is a core part of science and they use their senses to gather different types of information. Players identify, create, test, evaluate and document a range of design solutions to solve simple and complex problems to meet a range of needs.



















STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Earth and Space Sciences	SE1.1	Explore how changes can be made to the environment which can impact human activity	Engineering (Design process for Innovation, Natural & Built Environments)	Craft a tent for the night!	Oh-oh we need a place to sleep! Use Socket's crafting module to make a holo tent and setup based camp before the sun goes down.	Day and night occur because the planet is turning and sometimes you can see the sun, and other times you can't. It takes 24 hours for the planet to turn all the way around... that makes one day and one night!	Night is when the sun is on the other side of the planet from us, and its light and heat don't get to us. At any moment, half of the world is in daytime and half is in nighttime. Whoa!		25%		25%
Earth and Space Sciences	SE1.2	Observe and describe objects and events encountered in the world.	Arts (Photography)	Take a planet photo survey.	This new planet is too exciting! Use your camera to survey the area. Take snaps of land formations, animals and plants, then name each in your photo journal.	Woot! Lets explore our new home. Look for important landmarks that might be good for building an observatory or shelter, rivers or lakes for fresh water or land suited for farming.	I don't see whole lot of animals roaming around, but try and capture them if you see them. Take photos of plants too, there are over 2,000 varieties of plants used for food back on Earth. We might find some here!		25%		25%
Earth and Space Sciences	SE1.3	Identify and collect useful resources.	Engineering (Food Production)	Scavenge fruit and vegetables.	Our food stores are getting low, lets search for plants and trees that might yield edible fruits, nuts and vegetables we can use to craft food.	Scavenging or foraging is a common way to find food by searching out likely places for edible plants or animal remains. Eeek! Other methods for gathering food, including farming, hunting, gardening, and fishing.	Many animals forage for food, which includes hunting. Since the animal's environment is constantly changing, the ability to adjust foraging behavior is essential for survival as foraging unsuccessfully expends energy without finding food.		25%		25%
Earth and Space Sciences	SE1.4	Organise observations and make predictions	Arts (Photography)	Survey a spot for base camp.	Mission Control want us to build a base camp. Lets find and photograph a good site for the base, then create a design plan in the journal. Lots to do!	A home away from home, a well designed base camp is critical for remote explorers like us! It provides protection from extreme weather and predators, safely stores supplies including food and equipment, and acts as a comms center for updating Mission Control.	When surveying for a base camp consider the geography of the land. Is it large enough? An elevated area may provide great view, but is it accessible? And is it easy to fortify against extreme weather or predators? Are there hills or trees that provide extra protection? How about fresh source of water? And can the area be easily farmed for future food?		25%		25%
Biological Sciences	SB1.1	Identify and classify types of animals	Engineering (Natural & Built Environments)	Identify and classify animals.	Lets get to know our animal neighbours better! Take photos and name each animal, then classify as herbivore, carnivore or omnivore after observing their behaviour.	Like us, different animals prefer different kinds of food. Herbivores eat only vegetation like grasses, fruits, and leaves. Carnivores only eat meat from other animals. Ouch! Omnivores eat both plants and meat, basically they eat everything!	Taking wildlife photos requires stealth and patience! Use natural light, stay hidden, and keep very quiet. Did you know you can even build hidden bunkers to camp in secret for days? From your hiding spot you can capture the perfect shots of dangerous animals like lions and bears. Growl!		25%		25%
Biological Sciences	SB1.2	Experiment by interacting with living and non-living things to provoke reactions	Engineering (Natural & Built Environments)	Build a wall around your base.	Time to start fortifying the base camp! Lets start by building a short walled barrier around the camp to keep roaming animals out.	My scanners show this planet is similar to Earth and is basically made of living and non-living things. Living things sense their environment, eat, breath, grow, move and reproduce. Non-living things lack senses and don't eat, breath, grow, move or reproduce.	Did you know that an ecosystem is all living and non-living things and how they interact with oneanother? An ecosystem may be small like a pond. Or it can be large like a desert or rain forest. Some non-living things are super important for living things like plants and animals to survive, including water, air, soil, minerals and sunlight.		25%		25%
Biological Sciences	SB1.3	Experiment by interacting with living and non-living things to provoke reactions	Science (earth and space) Engineering (design process for Innovation)	Terraform an island bridge.	Use your gauntlet to terraform a land bridge from the mainland to an outlying island so the animals there can roam and forage for food.	Every animal needs energy from food to live. A food chain shows the feeding relationship between plants and animals. Nutrients and energy flow through the food chain as one eats another, usually starting with a plant then a series of different animals.	Rabbits are herbivores. Giving them access to the mainland is certainly going to make foraging for food easier! They'll need to watch out for meat eating carnivores like lions and tigers. And probably also omnivores like bears, who basically eat everything. Ouch!		25%		25%
Physical Sciences	SP1.1	Transforms energy into light	Technology (Power and Energy)	Circle base camp with lights.	Craft colored ground lights and then use these to create a ring of lights around base camp to mark the area and warn off predators.	Light is a form of energy made of tiny photons that travel as waves. Light can be seen by the human eye and is needed for the sense of sight. We can only see light waves when they are bounce off an object. This is called reflection. Light travels super fast, almost 300,000 km per second. Wowzers!	Light is super important and helps us see in the dark, especially in colors. Lights can be used to create a boundary to ward off predators. Lights are also used for signals like traffic lights which use different colors like red for stop, orange for danger, and green to signal go.		25%		25%
Physical Sciences	SP1.2	Links direction of force with movement	Engineering (Design Process for Innovation)	Base camp marker drone!	So we never get lost on night excursions, create a verticle-only flying drone with a light to mark base camp from a distance.	A force is basically a push or pull. Applying force affects the motion of an object, causing it to gain speed, slow down, to stop, or to change direction. The direction in which the object moves can be controlled by the direction and amount of force applied to it.	Propellers are machines that move an object forward when their blades are turned really fast. As the blades rotate, they deflect air backwards, and this air pushes forward on the blades. This force is called thrust and gives airplanes and helicopters the ability to escape the pull of gravity and fly.		25%		25%
Physical Sciences	SP1.3	Experiment with force and movement	Engineering (Design Process for Innovation)	Modify rover for more traction!	So many places to explore! Modify your rover with the builder so it has tracks instead of wheels and can travel steeper mountain areas without losing traction.	Friction is caused by one surface moving over another. Traction is the friction between the moving object, and the surface it moves upon; just like a wheel on the road. Traction is dependent on friction and so to increase traction, we must maximize friction. One way to do this is to increase the weight pushing down on the wheel; another is to make the wheel bigger.	Using special wheels, tracks or tread for greater traction allow vehicles to travel up steeper hills or paths that are slippery like muddy inclines. Greater amounts of traction also allows vehicles to improve breaking or stopping and travel faster while turning and cornering.		25%		25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

TECHNOLOGY

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Core Objectives: Players demonstrate knowledge of the role technology plays in a changing world and develop skills in computational thinking, systems thinking and coding. Players develop understanding that we live in a digital world where technology underpins everything we do. They learn that coding is becoming an increasingly important contemporary literacy. Players learn to use coding to debug problems, to program different types of robots for different purposes, and to design simple games. They recognise and use different technologies to tinker, experiment, play, design, iterate, and make solutions to problems.

















STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Coding	TC1.1	Basics of coding & Block Code Identify parts of the coding UI: commands, scripts area, stage Creates sequence of steps (an algorithm) for a bot to follow.	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Create a Code Sequence	Wow you've discovered a space relic! Seems like this bot is not working? Do a systems check and then try to restore the bot by fixing the bugs in its blockly code.	Robots like me and this bot here only follow instructions we're given. Programming is giving a sequence of instructions to a computer to follow. Luckily for you I'm programmed to be helpful!	Sometimes a bot can go haywire, kind of like if bugs got into its wiring. Most 'bugs' are just problems with its code which are found and fixed by 'DE-BUGGING' which is when you try to fix the code.		25%		25%
Coding	TC1.2	Connect/Fix Block Codes Explain and validate the importance of sequencing codes to create algorithms. Introduce and emphasize the concept of debugging	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Debug the code to fix the robot	This planet has strong magnetic fields, which seem to have messed up this robot? It cannot be remote controlled anymore. Try debugging the blockly code to fix it.	All robots need instruction, coded as detailed STEPS that are programmed in their robot brain or CPU. Take notes! There are lots of words coming your way! The program's code has steps called ALGORITHMS. The instructions are called COMMANDS.. A LOOP is a sequence of commands repeated a number of times.	If you have a bug, no problem! A simple way to debug in blockly is to use the PLAY button so the code RUNS while observing your robot. Look for broken code as the program runs or for problems with the robot trying to complete its task. Compare the two to check if the sequence is correct or where it needs fixing.		25%		25%
Coding	TC1.3	Simple Events & Triggers Program a bot to respond to external or internal changes (triggers). using OnClick and OnActive.	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation) Science (Biological Sciences)	Add sound FX to your robot!	The old bot is so quiet? Use TRIGGERS to upgrade it's code so the bot can express itself with beeps when ACTIVE and when SELECTED.	Wow tinkering the bots already huh? Just stay away from my systems ok! An EVENT is an action that causes something to TRIGGER or happen in code. Events like ONACTIVE trigger commands to run when the robot is active. ONCLICK triggers commands when the robot is clicked.	To trigger sound effects when the bot is active, use the ONACTIVE event code with sound code scripts. You can use the instrument block code to play different notes, or cheat and use the play sound effect code!		25%		25%
Coding	TC1.4	Events & Loops Differentiate events from loops Use loops to simplify repetitive code	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation) Technology (Systems Analysis)	Debug the Sentry Drone	Something's up with the drones systems, it keeps changing color when moving. It should be playing a motion sound instead. Check the code and fix?.	Have you ever felt like your stuck, and going around in circles? That is because you were in a LOOP. These can be great when you have to do something repetitive but don't want to write LOTS of code. Sometimes bots or drones can get stuck in a LOOP and need debugging to help it do what it is supposed to.	LOOPS are commands that trigger actions to happen over and over again, usually for a set number of times. This sentry bot's AI uses loops to replay sound while in motion. Check the code inside the loop to debug what's wrong.		25%		25%
Coding	TC1.5	Simple Shapes, Sequencing & Loops Code robots to form shapes and angles using repetition and loops Create loops to create complicated repetitive behaviour	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation) Mathematics (Calculating) (Shapes and Representation)	Fix the Drone's navigation code	This Sentry Drone isn't navigating as it's supposed to. It should be scanning a square area. Check its MOTION CODE and debug the issue so its back on track.	LOOPS are great! If you think about it, ALL shapes are just lines joined together at angles. If you wanted to move in a square you could just move forward, turn left 90 degrees and repeat (loop) those steps three more times to close the shape! This bot's navigation uses LOOPS to draw its square path by repeating move and turn steps.	In coding a SEQUENCE means the ordered steps in a program. Seems like there is something wrong with this bot's sequencing since it seems to be making the right moves, but not in the right order! Check the code inside the LOOP to debug what's wrong.		25%		25%
Coding	TC1.6	Learn about Conditional Logic Use conditional IF statements to control a bot.	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Fix the Glitch!	Wowzers! Seems there has been a glitch in your drone's code, the REMOTE CONTROL is not longer working. The code has been lost and needs to be reprogrammed!	A CONDITIONAL , is a statement that only runs if something else happens first. Checking conditions is very important in coding. If you ask yourself, "Am I hungry?" and reply, "No!" and then never ask again, you'll never know if you should get food. IF conditional statements are great in loops if you need to check for something over and over again and can't use a trigger.	So basically, us robots ask a lot of questions! The CONDITION is the response to those questions. If the response is YES, the condition is TRUE. If the response is not yes, then the condition is FALSE and the program will not do anything. IF statements like this are called CONTROL STRUCTURES because they control the flow of a program. Cool Huh!		25%		25%
Coding	TC1.7	Toggle variables Use toggle switch code to change a setting from 1 to 0 or TRUE to FALSE	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation) Art (Photography)	Bring Camera systems online!	Getting data from your drone is certainly useful, but seeing what it sees is even better! Add code to TOGGLE its camera systems on-off so you can take pictures!	Down deep computers only know about 1's and 0's, On and Off or TRUE and FALSE. 'TOGGLING' means to change a value from what it currently is to the other option. e.g. From TRUE to 'FALSE' or from "OFF" to "ON"	Did you know that CONDITIONS that can either be TRUE or FALSE are called BOOLEAN blocks?. If the condition is set to TRUE, then it is ACTIVE, if set to FALSE then it is NOT ACTIVE.		25%		25%
Coding	TC1.8	IF/ELSE Statements Use a single conditional IF-ELSE statement to create reactive bot behaviour	Technology (Making) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Enable Night Vision!	Sensors for sound, touch, temperature and navigation give robots information about their environment. Activate the drone's night sensors so its lights turn on automatically.	Here are those useful IF statements again! Sometimes you need your Drone to do something if the IF statement is TRUE and something else if it is FALSE. We can do this by adding an ELSE to the IF statement. Now our Drone can perform one action if the condition is TRUE, and a different action if the condition is FALSE!	Night vision is being able to see in the dark. Some animals, like cats, are especially adapted to see well in the dark. Humans do not have good night vision. Robot use special sensors to see in low light. The three main types of night vision technology are low-light imaging, thermal imaging and near-infrared illumination!		25%		25%
Robotics	TR1.1	Introduction to robots	Technology (Making, Coding) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Craft a robot Sentry.	Who's speedy and gets tasks done right? A robot. Craft a Sentry Bot to guard base camp.	Arms, sensors, and wheels, oh my! Robots can have them all. A robot has four essential characteristics: sensing, movement, energy and intelligence. Artificial Intelligence (AI) comes from the instructions stored in the robot's central processing unit or CPU.	Sensors for sound, touch, temperature and navigation give robots information about their environment. Some robots are like humanoids. They have arms and legs, while bots for exploration may have wheels, tracks, or propellers.		25%		25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

TECHNOLOGY

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TECHNOLOGY

















STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Robotics	TR1.2	Identify the proper sequencing of codes	Technology (Making, Coding) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Debug a looping sentry bot.	Check the sentry bots code and debug to fix its path back and forth in front of base camp.	Woah! Looks like this sentry bot is stuck in a loop! It should be roaming back and forth in front of the base camp to guard the perimeter. My guess is the blockly code inside its loop needs debugging.	Loops are commands that trigger actions to happen over and over again, usually for a set number of times. This sentry bot's AI uses loops to repeat its back and forth path. Check the code inside the loop to debug whats wrong.		25%		25%
Robotics	TR1.2	Identify the proper sequencing of codes	Technology (Making, Coding) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Debug a looping sentry bot.	Check the sentry bots code and debug to fix its path back and forth in front of base camp.	Woah! Looks like this sentry bot is stuck in a loop! It should be roaming back and forth in front of the base camp to guard the perimeter. My guess is the blockly code inside its loop needs debugging.	Loops are commands that trigger actions to happen over and over again, usually for a set number of times. This sentry bot's AI uses loops to repeat its back and forth path. Check the code inside the loop to debug whats wrong.		25%		25%
Robotics	TR1.3	Interact with a robot for a specific purpose.	Technology (Making, Coding) Engineering (Simple and Complex Machines) Engineering (Design Process for Innovation)	Upgrade your drone with solar.	Having to replace the surveillance drones batteries isn't ideal when it should by way up high monitoring. Add a solar panel so it can recharge using sunlight.	Some robots don't need someone to control them! Cool! They're called an autonomous robot. Robots that can function on their own are very useful in remote exploring, space flight, and even dangerous missions in place of people! Advanced autonomous robots have lots of sensors and an AI system can learn from the environment, experience, and build on what it can do.	All across the universe, robots are drinking the sun for energy! Many robots use batteries for power with solar panels to recharge them while they work. Solar energy is the cleanest and most available renewable energy source. It is well suited for robots in hard to reach places includinh space explorer bots!		25%		25%
Systems Analysis	TS1.1	Plan a mission to the polar continent including gears and supplies.	Engineering (Design process for Innovation, Natural & Built Environments) Science (Earth and Space Science)	Plan for an icy adventure.	Woot! You've unlocked the polar continent. The polar climate is extreme, with zub zero temperatures. Plan your mission carefully before exploring.	Do you know what a "system" is? A system is a collection of things that interact as a whole for a special purpose. I'm a complex system, and in fact so are you! All the parts in your body work together for a higher purpose. And all of them must be present for your bodily systems to work properly.	There are many types of systems, which vary in size from small to larger systems containing many sub systems. There are natural and human-made systems. When you think about a system, start by writing a list of whats inside the system and whats outside or part of the environment.		25%		25%
Power and Energy	TP1.1	Identify different components involved in a system (natural)	Engineering (Natural & Built Environment)	Upgrade rover's power supply.	Craft an energy core to upgrade your rover so it has greater capacity for longer missions.	Energy is used to do everything! There are many different types of energy from different power sources. Your body makes energy from the food you eat, robots like me use batteries for electrical energy. Most of the world's energy comes from coal, gas, oil and nuclear. These are all non-renewable energy because the world will eventually run out. Eeek!	Unlike coal, gas, oil and nuclear, renewable energy comes from sources that wont run out like the sun, wind and earth. Renewable energy sources like solar, wind, tidal and thermal can be used over and over again. They are also called "clean" or "green" because renewable energies dont pollute the air and water. This is great for the planet!		25%		25%
Power and Energy	TP1.2	Learn about objects that require different power sources	Arts (Colour & Style)	Give your rover more power.	Upgrade your rover with dual engines so it has more power. Connect another power source for the extra energy needed, then add solar panels to recharge on the go!	Everything needs a power source to supply energy for activites or work. Some activities need more energy than others because the work being done is greater. Two engines working together will be more powerful than one engine, but will require more energy too.	Batteries come in all sizes and turn chemical energy into electrical energy. Space probes and robotos use rechargeable batteries that can be refilled with energy from solar panels that capture the suns energy and convert it to electricity. Did you know the suns energy hitting the earth could power everything on the planet? We just need to learn how to properly harness it!		25%		25%
Making	TM1.1	Select and add power sources to objects	Engineering (Natural & Built Environment)	Build a lunar rover.	Walking is great exercise but too slow! Build an all-terrain Lunar Rover to explore the world in quick time. Keep an eye out for new quests and resources!	Cool! A Lunar Rover... lets roll! A Lunar Rover is a battery powered all-terrain low gravity vehicle first used during the Apollo moon missions in 1971 and 1972.	Also called a Moon Buggy, rovers are four wheel drive machines. This means they can cross all types of terrain and change direction quickly. The original Apollo rovers are still on the moon! Whoa!		25%		25%
Making	TM1.2	Learn about the different elements required to construct different products	Engineering (Design process for Innovation, Natural & Built Environments)	Build a house at base camp.	Now you've settled in at base camp, improve your living conditions by building a house that's better suited for the long mission ahead!	What does it take to live on the moon or another planet? The Earth supports many life forms, trillions actually! It provides air to breath, drinking water in lakes and rivers, and lots of food sources. The gravity on Earth isnt as fun as the moon, where astronauts can jump higher, but its not crushing either! And the Earth's atmosphere also protect's us from harmful space radiation!	Building space habitats can be tricky! The design requirements will differ depending on the planet or moon and attributes like gravity, climate, resources, atmosphere and other factors. Living quarters are important, but so are science labs, storage and other rooms. Habitats on places like the moon with little or no atmosphere must be sealed with special doors called airlocks!		25%		25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

ENGINEERING

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Core Objectives: Players demonstrate knowledge of process, design, and skills in constructing solutions to complex problems. Players develop design thinking skills to design and construct a solution to an identified problem - simple or complex. They identify and select a variety of materials and processes to experiment, test, prototype, iterate and construct, individually and collaboratively, a range of possible solutions.

STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Design Process for Innovation	ED1.1	Select appropriate materials to meet a design need	Science (Physical Sciences)	Build a boat to explore islands.	Wondering what's out across the ocean blue? Build a motor boat to explore the islands and collect data for Mission Control.	How can we build a boat that floats and allows us to carry equipment to the outer islands? Start with a design idea, imagine how it will look and work, then create a design plan. Once you have the plan use the builder to create your boat. If something isn't working quite right, think about ways to improve it and try something new.	Whether their goal is to create a spaceship or a bridge, engineers rely on the design process to guide them. It's the series of steps that begin with a question that needs solving by designing a solution. Often there is more than one solution to any question and the first design can always be improved! It's easy, just remember these steps: Question, Imagine, Plan, Create, Test, and then Improve.		25%		25%
Design Process for Innovation	ED1.2	Identify needs and wants	Science (Physical Sciences)	Fortify your base camp!	Upgrade your base camp's defenses by building a bunker to defend against the monsters!	Wow we have a problem, those Monsters won't let up and so far we haven't been able to stop them from stealing our stuff! Let's upgrade our defenses by building a bunker we can use to hide in wait, then zap the pesky invaders with our light taser. That'll show 'em!	A bunker is a small building, that's mostly underground so it's partially hidden. Bunkers have thick walls and roofs for extra protection and small windows for spying invaders. Build the bunker at the entrance to an area the Monsters must pass through to get to the supplies they want to steal. When the times right, surprise them!		25%		25%
Design Process for Innovation	ED1.3	Follow a pre-made design solution	Maths (Shapes & Representation) Technology (Systems Analysis)	Craft a cooler for base camp.	Storing food supplies is a smart move for any explorer. Craft a cooler unit to store food for longer and prevent spoiling.	Food spoils when it gets old. This is because bacteria, yeasts and fungi feed on the food and break it down. These micro-organisms grow much slower at lower temperatures, so the cooler you can keep your food, the longer it will last. That's where a refrigerator, or in space explorer terms: cooler unit, can help!	Cooling and freezing are only temporary ways of preserving food. The micro organisms in the food are not destroyed, their growth is just slowed. Once the food has thawed the bacteria, yeast and fungi will begin to grow again. Eeek!		25%		25%
Simple and Complex Machines	ES1.1	understands the purpose of simple machines and the common types	Technology (coding)	Build a lunar rover.	Walking is great exercise but too slow! Build an all-terrain Lunar Rover to explore the world in quick time. Keep an eye out for new quests and resources!	Machines can be super complex, like a robot or helicopter, or very simple like a can opener. Simple machines are made up of just one or two parts and make work easier by changing or multiplying a force.	Simple machines include levers, inclined planes, wedges, pulleys, wheels and axles. All of these make work easier by creating a mechanical advantage. This means less force is needed to do the work thanks to the machine's design. Cool huh!		25%		25%
Simple and Complex Machines	ES1.2	Create an inclined plane	Maths (Shapes & Representation) Technology (Systems Analysis)	Build a platform and ramp.	Build a raised platform only reachable via ramp for a future helicopter landing pad.	When you build a ramp up to the platform, you're creating a simple machine called an inclined plane: a flat surface with one end higher than the other. This allows us to slide or drive equipment up to the platform, which is easier than having to lift it.	Did you know, simple machines can be combined together to form compound machines? Big compound machines like a space ship consist of hundreds or thousands of simple machines working together. Compound machines make work even easier because all machines together have a greater mechanical advantage!		25%		25%
Simple and Complex Machines	ES1.3	Use appropriate parts	Engineering (Natural and Build Environments)	Modify rover for more traction!	So many places to explore! Modify your rover with the builder so it has tracks instead of wheels and can travel steeper mountain areas without losing traction.	Friction is caused by one surface moving over another. Traction is the friction between the moving object, and the surface it moves upon; just like a wheel on the road. Traction is dependent on friction and so to increase traction, we must maximize friction. One way to do this is to increase the weight pushing down on the wheel; another is to make the wheel bigger.	Using special wheels, tracks or tread for greater traction allow vehicles to travel up steeper hills or paths that are slippery like muddy inclines. Greater amounts of traction also allows vehicles to improve breaking or stopping and travel faster while turning and cornering.		25%		25%
Food Production	EF1.1	Identify elements that could be used for food and create basic food to suit immediate needs	Science (Biological Sciences) Technology (Making)	Search for food to craft meals.	Collect enough food from scavenging the surrounding area to craft two days worth of meals. Be sure to include drinks too.	Until we get a farm pod up and running we'll have to make do with scavenging foods already growing in the wild. Look for trees and bushes and explore to find fruits, vegetables, nuts and seeds to craft meals. You need to stay hydrated too, so nab any coconuts you come across for a nourishing drink!	Did you ever hear the saying "You are what you eat"? It's not just a saying it's actually true. Eating a mix of healthy foods promotes health and provides energy for growth and activity. Healthy foods are rich in nutrients the body needs like sugar, fiber, proteins, fats, vitamins, minerals and water.		25%		25%
Food Production	EF1.2	Plants and animals can be used for food and fibre production	Science (Biological Sciences)	Farm to increase food supplies.	Create your very first farm, using chickens for eggs and cows for milk.	Back on Earth, farms are super important for food and clothing. Crops like rice, wheat, corn, fruits and vegetables are grown to feed people and animals, and for fibers like cotton. Animals provide meat, milk, and eggs for food and also wool and leather for clothing. Common farm animals include chickens, cattle, pigs, sheep, goats and buffalo.	Food and drinks give your body the water and energy it needs to survive. Water is essential, and we need energy for everything we do. There are five main food groups you should eat every day to get all the nutrients your body needs to stay healthy: Grains like bread, pasta and rice; Dairy like milk and cheese; Fruits; Vegetables; and Proteins like meat, eggs and nuts.		50%		25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

ENGINEERING

6

ENGINEERING



















STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Food Production	EF1.3	Plants and animals can be used for food and fibre production	Science (Biological Sciences)	Expand the farm with new crops.	Expand your farm by adding corn, rice and fruit trees. The new crops will add to your food supplies and allow you to craft more types of foods, improving your diet.	Do you know some different types of farms? There are crop farms, which grow fruits, vegetables, grains and cotton. Animal farms raise animals for meat, eggs, milk and fibres. Can you guess what happens when you combine crop and animal farms? You get what's called a mixed farm! There are also fish farms in our rivers and oceans raising fishes like carp, salmon and shellfish.	Do you know what a Calorie is? It's simple! Calories are used to measure the amount of energy in food. Kinda like a fancy name for food energy. The more calories, the more energy food has! Guess how many calories a day your body needs? About 2,000 per day depending on how active you are.	Newbie Farmer	50%	Dont Starve	25%
Natural and Build Environments	EN1.1	Create and manage simple natural relationships	Science (Biological Sciences)	Build a chicken shelter.	Design and build an enclosure for your farm chickens to keep them warm at night, protect them from predators and increase egg production.	We seem to be the first space explorers to visit this planet. And you know what that means? My scanners show no buildings, roads or other built environments made by people. This marvelous new planet is just one big collection of natural environments, from its mountains, lakes, and rivers, to the forests, grassy plains, beaches and oceans.	Do happy hens lay more eggs? You bet they do! Let's give the chickens something to cluck about by building them a cool enclosure. What design elements are important to make the chickens happy? It should keep them warm at night, provide a place to sleep and protect them from the weather and predators. Anything else?	Engineering 101	25%	Construction 101	25%
Natural and Build Environments	EN1.2	Explore local environment to meet immediate needs	Science (Biological Sciences)	Build a hidden supplies bunker.	Terraform an ice cave with a secret entrance to use as an emergency storage bunker for food and supplies.	Building a habitat in the polar region is a challenge. You should consider the special design needs for living in the extreme cold, and any important mission requirements like storage or a science lab. First up Mission Control want us to build an emergency storage bunker. Let's get to it!	Back on Earth, built environments were all around us, from a small building to a whole city. Built environments like cities rely on many elements that work together to support the city's people. These are called systems and include stuff like transport, phone networks, water and power supplies. Can you think of other systems?	Engineering 101	25%	Habitats 101	25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

ARTS

7









Core Objectives: Players demonstrate knowledge of design aesthetics and skills in design thinking. Players experiment with colour, pattern, perspective, light, shadow, and placement for artistic purposes. They develop their natural creativity to use design presentation aesthetics to enhance their environment. They use all senses to create a melodious and sensorial experience for themselves and other participants in the world.

STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Color and Style	AC1.1	Experiment with different colours to improve aesthetics of objects	Engineering (Design Process for Innovation)	Give your rover a paint job.	Use the painter to give your rover that special look and style. Take photos and add notes in the journal about your favorite colors and why you chose them.	Sometimes its great to blend in when exploring, consider giving your rover a paint job that will help disguise it by making it look similar to the planet's trees or environment. This is called camouflage! Of course if you'd rather find the rover easily, you can always just paint it yellow like me!	Using and mixing colors is an important skill for art and design. Your painter organises colors in a color circle, which shows the relationship between the primary and secondary colors and everything inbetween. You can pick any color or a blend of these at any point on the circle for the perfect mix!		25%		25%
Color and Style	AC1.2	Test different tools to determine different colour effects	Maths (calculating) Science (earth and space)	Give your house a paintover.	Use the painter and texture library to give your house a distinct look and style. Take photos and add notes in the journal about your favorite colors and textures.	Have you tried using a mix of colors to create different moods? Colors are a powerful way to create a feeling or mood, and you might want to choose different moods depending on the purpose of the room or area. Ever wonder why special events use a "red carpet"? Because red makes people feel important. Many people even wear red on their birthdays!	The painter tool also has a library of textures like wood, metal, rock and others. You can use textures to add a realistic look or create a special mood. Using textures also allows you to change the material's physical properties. Use a wood texture and blocks will float in water. Change to a rock or metal texture and they will be heavier and sink. Cool Huh!		25%		50%
Color and Style	AC1.3	Different colours and effects can create different moods and change aesthetics.	Engineering (Design Process for Innovation)	Add personality to your drone!	Use the sticker tool and painter to add personality to your base camp's flying sentry drone.	A cool feature of the painter are stickers! Add stickers in patterns and combinations to create personality and mood.	Painting or using stickers to add animal or human-like features to machines is a popular way to add personality to mechanical friends. Often people also name machines, which is especially common for important machines carrying passengers like boats and planes or machines used for adventure or sports like motorbikes or racecars!		25%		25%
Music and Sound FX	AM1.1	Identify sound fx	Technology (Coding; Robotics)	Add engine sound FX to the rover.	Use blockly to code your rover to play an engine sound FX when driving. Experiment with volume control.	Sound effects together with music are super important in film, games, and other entertainment to add mood and meaning. You can carefully time different sound effects to create different reactions and feelings depending on the action. Use the Play Sound block to trigger the engine sound FX when your rover is active. Try increasing the volume when its moving for variety and drama.	Sound is an important part of how we sense the world around us. Whether natural or made, sounds give the listener important clues about their environment. Sounds change moods, and can add drama and excitement, or bring a feeling of relaxation and calm. People and animals use sound for expression and communication.		25%		25%
Music and Sound FX	AM1.2	Experiment with different sound effects to punctuate events or actions	Technology (Coding)	Add a music player to the rover.	Every space explorer needs some funky tunes while cruising in the rover. Craft a music player for your rover to break the silence.	I was thinking it's a little too quiet on our rover missions. Adding a music player for some tunes seems like a stellar idea!	Use your crafting grid to make the music player. Once you upgrade the rover, use blockly to write some code so the music player can be switched on or off with a mouse click.		25%		25%
Music and Sound FX	AM1.3	Combine movements and/or visual FX with sound FX	Technology (Coding; Robotics)	Add color change to your drone.	Upgrade your flying sentry drone so it changes color when switching to camera mode. Add a cool sound FX for good measure!	Upgrading your drone again huh? You'll need to add another condition to OnClick. You already have OnClick (Camera=TRUE). Just add some code in the sequence to Change Color . Pick any color you like!	Color is a great way to signify change. But do you know what else is good? Sound! Use the blockly code to trigger a sound FX OnClick too. That way you are making more impact to signify the drone's change to camera mode. Woot!		25%		25%
Photography	AP1.1	Learn how to use camera and journal	Science Biological Science)	Take photos of flora and fauna.	Mission Control have requested a photo survey of the animals and plants on the planet. Explore the area and take pictures, then add notes in your journal.	Woot sounds like you have some picture snapping to do! Depending on what your snapping, you'll need to adjust your zoom for the perfect shot. A close-up is great for detail, especially for parts of plant like flowers and fruits, an animals face to capture its expression, and small creatures too.	A mid shot is farther away than a close up, and is used to capture a subject when you want a mix of the detail you get in a close up, and a picture that shows more of the character or characters. If you zoom out further to capture the characters and more of their environment, thats called a full shot.		25%		25%
Photography	AP1.2	Learn how to use camera and journal	Science (Earth and Space Science)	Capture constellations at night	Take photos of the constellations at night. Name the photos in your journal and write about the difference taking photos at night compared to the day time.	If you look up at the night sky do you see any pictures in the stars? If you do, these are called constellations. There are many famous constellations seen from different parts of the world. Taking photos at night is tricky as camera's rely on light to capture color and detail. But see if you can snap some constellations anyways.	Your flash wont be much help because the constellations are too far away for its light to reach them. Instead, keep the camera shutter open for longer to capture the light reflecting back from the stars. This is called slow shutter or long exposure photography.		25%		50%
Photography	AP1.3	Capturing motion	Science Biological Science)	Get wet for photos of fishes.	The photos you uploaded surveying the planets flora and fauna were great! Get suited up and take a deep dive to capture pics of the planet's underwater environment.	Ahoy diver below! I bet you already know that the ocean is home to more life than you see on land? The ocean is teeming with life forms of all shapes and sizes, from the sea weeds and corals, to crabs, fishes, sharks, dolphins and whales to name a few.	Taking pics under water can be a challenge. Before you get snapping be sure to master your diving skills so you can adopt a stable position under water to take good shots. Set your flash to "on" since there is less light in the deep, and look for close up rather than mid shots and long shots to avoid water blur or distortion.		25%		25%

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

MATHEMATICS

Core Objectives: Demonstrates knowledge of mathematical concepts and skills in investigating, representing and interpreting mathematical problems. Players think analytically and use reason and logic to interrogate, calculate, process, manage and representa data relating to their experience in the world. They collect, classify, and proces data in a vareity of formats.

STEAM Concept	Quest Code	Learning Objectives	STEAM Integrations	Quest Summary	Quest Introduction	Example Quest Fun Fact	Example Quest Fun Fact	Badge Achievement	% XP	Badge Achievement	% XP
Calculating	MC1.1	Calculate solutions to problems using numbers and simple functions	Engineering (Natural & Built Environments)	Tally your building blocks.	Through trial and error, investigate the number of blocks it take to build your first homebase.	Mission Control want a full sitrep on how our resources are being used so they can help us plan for enhancements. The professor has asked you to count the number of blocks used so far to construct base camp and record in the journal with photos.	Once you have finished the tally, pick one enhancement for base camp that you might do in the future. Explain why its important and what it will be used for, then calculate how many blocks you might need for the project. Record your plans in the journal.		25%		25%
Data	MD1.1	Design and create tallies based on frequencies	Art (Photography)	Survey the penguin population.	Mission Control want a survey of the polar penguins. Take a trip and snap some pics of the penguins, then count and record the number you see in the journal.	Penguins are aquatic birds adapted for ocean life. They lay eggs, have feathers, and are powerful swimmers, but cannot fly. The only time penguins are airborne is when they leap out of the water to get a gulp of air before diving back down for fish. Penguins cannot breather underwater but are able to hold their breath for up to twenty minutes. Woah!	Penguins are social birds tend to feed, swim, and nest in groups. They mainly eat fish, but also eat other seafood they might catch like crabs and squid! Their funny tuxedo-like appearance is called "countershading," a form of camouflage to help keep them safe in the water from predators like seals and sharks.Eeek!		25%		25%
Shapes and Representation	MS1.1	Manipulate, sort, describe, various shapes in the environment	Arts (photography) Engineering (Natural and Built Environments)	Take aerial pics of base camp.	Take photos of base camp from the air. Add journal notes about the design of your base and why have you chosen the design you have, the advantages and disadvantages.	Aerial photos are usually taken with a camera mounted on the bottom of a drone or aircraft. An aerial photo allows a whole area to be observed rather than a portion of it. This way we can see survey resources, measure the length of rivers or size of land masses, and see patterns including how things might change over time.	When describing the features in aerial photos sometimes things can seem unfamiliar from high above.Try talking about about the size and shapes of objects compared to other photo features. Study and describe the colors too, as they tend to relate to the type and amount of vegetation in the photo.		25%		25%
Shapes and Representation	MS1.2	Construct simple representations to describe in-game phenomena	Maths (Calculation) Arts (Colour & Style)	Build a polar bear statue.	Find high ground on the polar continent, then use the builder to create a life like sculpture of a Polar Bear. Texture and paint, then take photos for your journal.	Building a statue seems very fitting for the king of the arctic zone! Polar bears are one of nature's toughest animals and live in the frozen wilds of the Arctic. They are huge!! Polar bears can grow 10 feet tall and weigh up to 1500 pounds, making them the largest land dwelling meat eaters on Earth. Woot!	Polar Bears are well adapted for subzero temperatures. Their white fur is actually transparent, allowing the sun to warm their black skin, which is great at capturing the sun's energy to help keep them warm. WHOA! Polar Bears have 42 teeth and are the largest carnivore (meat eaters) that lives on land. Seals make up most of the Polar Bears diet. Yikes!		25%		25%

MATHEMATICS

PLANETEERS - STEAM QUEST SUMMARY - LEVEL 1

STEAM Educational Standards Mapping

The STEAM standards and concepts in the STEAM Learning Continuum and educational quests mapped to the Planeteers game have been informed by a range of syllabus and policy documents including but not limited to the new Australian syllabus documents, the New Zealand syllabus, the international ISTE standards, and the IFTF future work skills 2020 document.

The standards are phrased as "learn about" and "learn to" statements. The "learn about" statements pertain to knowledge that is acquired through the achievement of the standard in question, while the "learn to" statements pertain to skills that are developed. Standards are also mapped to key concepts for each of the STEAM pillars.



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