



TanglIn

Tangible Programming & Inclusion

TanglIn Toolbox Minecraft

8-12 years old

Minerals

Probotic

Seriation

Itineraries



www.tangin.eu

 /tanginproject



Summary

Minerals - origin, properties and usefulness - and seriation with the Bot, according to some criteria.

Expected duration: **60 min** (the lesson plan duration is flexible, and teachers can adapt them accordingly to their needs and class duration).

Learning Outcomes

At the end of the session, students are expected to:

- Know that minerals are raw materials that are mined below the Earth surface;
- Identify some extracted minerals, their properties, and usefulness;
- Relate the mineral properties and usefulness;
- Sort in ascending or descending order;
- Program the robot adequately;
- Value STEM areas;
- Develop transversal competencies such as problem-solving, communication and reasoning;
- Develop group work skills, namely, to respect and favor the inclusion of all elements, regardless of gender, culture, etc.

Links With Curriculum Topics

Covered Curriculum Topics	
Subject	Topics
Engineering	Mathematics Algebra <ul style="list-style-type: none"> • Seriation Geometry <ul style="list-style-type: none"> • Orientation and localization – itineraries
	Science Natural resources <ul style="list-style-type: none"> • Minerals
	Technology Programming <ul style="list-style-type: none"> • Concepts of programming • Programs – Results, errors, and troubleshooting





Notes for Teachers

The teacher should suggest students to previously research some minerals - their origin, properties, and utility. And should prepare, in advance, all the materials needed and the classroom (namely the three groups of cards with the correct marks in the back) according to the activities to be developed.

The teams should be as heterogeneous as possible to foster the integration of all students.

It's important that clear rules are established in terms of group work. This way, it avoids the most active children assuming the lead and the quitter ones only observing.

This activity can be applied for other themes and subjects that can be ordered by intrinsic properties such as size, dimension, quantity, value, resistance, weight, antiquity (historical events or characters such as kings and scientific inventions).

After printing the cards, do the marking in the back (as in the example) to be able to confirm the correct sequence autonomously.

The teacher must circulate through the various groups to support the activities and the dynamics of each one. In the end, it should promote a collective discussion of the main issues focused and the constraints and difficulties experienced.

Lesson Plan

Intro	20'	Class	<p>"Today, MI-GO is going to adventure the mining world but needs help to understand the origin, some characteristics and the relations between the minerals and their usefulness."</p> <p>The teacher shows the mineral cards to the class and, from the students' research findings, promotes a discussion about minerals origin and their main characteristics (hardness/resistance, value/preciousness and quantity/rarity).</p> <p>Together, they also try to give examples of use: Coal/energy; Iron/construction; Copper/electricity; Gold, Diamond, Silver/jewelry and precision instruments.</p>	

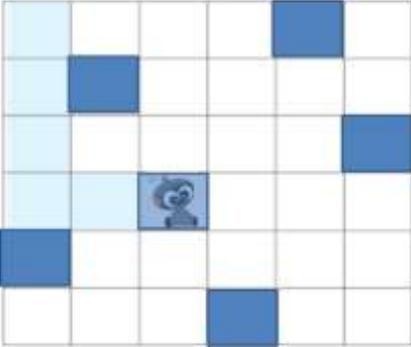
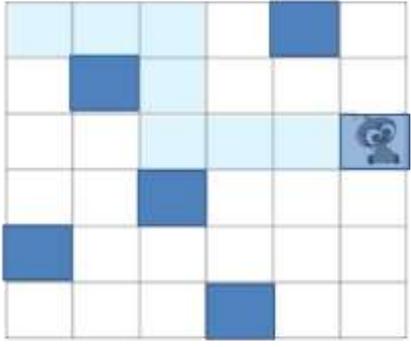




Prep	10'	Group	<p>The teacher establishes 3 heterogeneous groups and each of them will have a 6x6 grid and will color/fill one square (at will) per column (mines). On top of each column but outsider the grid, they will put one mineral card (at random) facing up.</p> <p>The BOT starts from the top right left square (if occupied, then the bottom left). The goal is to go to each mine in the right sequence as to put the mineral cards in the correct order, according to some characteristic (of the ones presented in the previous phase).</p> <p>The teacher should discuss/remember the concept of seriation - in ascending or descending order.</p>	
Play	15'	Group A	<p>Group A will have to mine and put the minerals in growing order of hardness/resistance.</p> <p>When they get to a mine, they will take the card on top the column and place it on the bottom in sequence. To confirm it is the right one, look at the back of the card and check if the mark in the left matches the one on the right of the previous one (see image below). If not, return it to the previous place and go to another mine until all sequence is complete and correct</p> <p>Sequence (back): each card follows the previous mark from left to right:</p>	





		Group B	<p>Group B will have to mine and put the minerals in growing order of value/preciousness.</p> <p>When they get to a mine, they will take the card on top the column and place it on the bottom in sequence. To confirm it is the right one, look at the back of the card and check if the mark in the left matches the one on the right of the previous one (see image below). If not, return it to the previous place and go to another mine until all sequence is complete and correct</p> <p>Sequence (back): each card follows the previous mark from left to right:</p> 	  
		Group C	<p>Group C will have to mine and put the minerals in growing order of quantity/rarity.</p> <p>When they get to a mine, they will take the card on top the column and place it on the bottom in sequence. To confirm it is the right one, look at the back of the card and check if it the mark in the left matches the one on the right of the previous one (see image below). If not, return it to the previous place and go to another mine until all sequence is complete and correct</p> <p>Sequence (back): each card follows the previous mark from left to right:</p> 	  





Share	15'	Class	<p>Each group will share their final sequence and explained it to the rest of the class.</p> <p>Compare the properties and discuss if there is a relationship between them.</p>	<p>A.      </p> <p>B.      </p> <p>C.      </p>

Resources List & Support Material

Per each group:

- A robot kit with drawing capabilities;
- Transparent scenario with a 6x6 grid.
- Markers for each group (easy to erase/clean);
- One of the three groups of 6 mineral cards (Annex)
- Alcohol for cleaning the scenarios (for teacher use only);
- Scissors (to cut the cards).



