Class 6

Lesson 6.8

Major Landforms of the Earth - Chapter 6

Parameters	Description	Note for teachers
Chapter Covered	Chapter 6: Major Landforms of the Earth	
Name of the Book	NCERT, Social Science Textbook for Class VI	
Learning Objectives	In the chapter Major Landforms of the Earth, we will be learning about major land form Like: - mountains their formation and classification. Plateaus and why are they also called table top, plains and the role of human being in preservation of mother earth. Also, we will be learning about the government's initiative of Swachh Bharat Mission. To enable learners to **Stage 1: Conceptualization Scholastic:** ● Identify two types of forces acting upon the surface of the Earth – Internal and External. ● Recognize the changes on the surface of the Earth due to these forces. ● Explain the formation of mountains and differentiate between the types of mountains. ● Explain the formation of plateaus and locate and list their usefulness. ● Explain the formation of plains and why the plains are densely populated as compared to other land forms. ● Relate with water pollution and land degradation and suggest measures to prevent pollution and land degradation. **AI and Tinkering** **Stage 2 : Apply Design Thinking** ● Identify two types of forces acting upon the surface of the Earth – Internal and External. ● Recognize the changes on the surface of the Earth due to these forces. **Stage 3: Making landscape** ● Explain the formation of mountains and differentiate between the types of mountains. ● Explain the formation of plateaus and locate and list their usefulness. ● Explain the formation of plains and why the plains are densely populated as compared to other land forms. ● To create a landscape by creating various landforms and 3d printing it. ● To test the created landscape against water to test for soil erosion **Stage 4: Making AI enabled software** ● Relate with water pollution and land degradation and suggest measures to prevent pollution and land degradation. ● Use Arduino hardware and coding in the ide. ● Apply AI to determine crop cycle.	Teachers can develop a ppt on minerals and energy resources, landforms and factors influencing the formation of land form.
Time Required	5 periods of 45 minutes each.	

Classroom/ATL Arrangement	Seating arrangement - ● Theory Sessions – regular classroom arrangement. ● Activity Sessions – Flexible (for group / pair work).	
Material Required	**Scholastic**: ● Textbook ● Smart Board / Screen ● Projector ● Globe ● Map ● Chart ● Pen and paper ● Laptop or smartphone ● White board and marker **AI and Tinkering :** ● Arduino Uno ● Jumper Cables ● Soil Moisture Sensor ● DHT 11 Temperature Sensor ● USB Cable for Arduino Connect **Landforms of the Earth (Reference material):** ● https://www.twinkl.co.in/teaching-wiki/landforms	
Pre – Preparation Activities	**Scholastic**: ● A video to show the internal forces acting upon the surface of earth. https://www.youtube.com/watch?v=9qa0Mt7HpGY) ● Sand to make a sand castle for illustrating external force acting upon the surface of earth. **AI and Tinkering:** ● The teacher needs to install tinkercad into the available systems. The teacher needs to understand the basics of tinkercad. https://www.youtube.com/watch?v=gOs6Mdj7y_4 ● Design Thinking Flashcards to understand empathy, defining the problem and ideation ● Understand the working of Arduino and the basics of AI. https://www.youtube.com/watch?v=nL34zDTPkcs&t=3s https://www.youtube.com/watch?v=2ePf9rue1Ao	Flash card activity can be done on different land forms and endogenic and exogenic forces. The questioning method should be practiced to keep learners engaged and manage the class time.
Previous Knowledge	**Scholastic**: The teacher initiates a discussion on the places visited by the students or their hometowns to bring out their understanding. ● of the physical features of the places. ● of difference in terms of weather and population. ● water Erosion and the way it works. ● soil fertility and components of nutrients in soil. **AI and Tinkering:** ● The ability to empathise and think holistically towards a problem statement in hand. ● The ability to create basic designs in tinkercad.	

	• Basic knowledge of data labelling and AI Modeling and how to interface a sensor and run a code on an Arduino.	
Methodology	**Stage 1: Conceptualization Scholastic: (Social Science Teacher)** **The teacher** • Shows a video to make the learners recapitulate and understand the two types of forces of the earth. https://www.youtube.com/watch?v=9qa0Mt7HpGY • Shows a demonstration of water waves and gusty wind affecting the sand castle. • Asks the learners to list the changes in the earth due to the action of internal and external forces. • Explains how different types of mountains are formed and makes use of maps to highlight the location of major mountain chains. **Activity**: • Experiment with a piece of paper to see how a fold mountain is formed. • Experiment to show the formation of Block Mountains through cutting of an eraser and showing the positioning in a way block mountains are formed. • The teacher asks the learners to research using Google Earth to find plateaus, in or around their country. Students identify the features of plateaus. • The teacher takes the students for a nature walk in the school garden, where they observe the flat and elevated surfaces. They identify the flat surface as plains and draw parallels to distinguish plains from the plateaus. • The teacher further holds a class discussion on the environmental issues leading to degradation of landforms of the earth. The suggestions to prevent pollution and land degradation are elicited from the students. (Reference for the teacher: 1. **Landforms (Closure Activity):** https://www.twinkl.co.in/teaching-wiki/landforms 2. **Formation of Block Mountains** https://www.youtube.com/watch?v=kw9mMKUgwBk) **Contextualization**: **AI and Tinkering**: **Stage 2: Apply Design Thinking framework** ***(refer to chapter 2.1 for details on Design thinking Framework)*** **on the given scenario (Subject Teacher & ATL in-charge)** **Problem Statement / Scenario:** *During a nature walk, Rani, a student, notices that some piece of land in the playground, adjoining the garden, is getting additional mounds of soil. She brings it up during discussion with the teacher in the class.* **Empathize**: The students brainstorm and analyse that the school gardener switches on the electric motor every day to pump out water for the plants in the garden and leaves the water pipe at one place for a very long time. The water overflows causing the soil also to flow and accumulate in the playground. The students are asked to ponder on the following questions: 1 What does Rani notice and what emotions might Rani be feeling? 2 What does he say or do? 3 What can be some advice/comments Rani gets from his friends/family? 4 Why are the students concerned? **Define**: Students are asked to think deeply and try to find a solution. They are asked to think about the following questions 1 Do you also witness such situations?	

2 Can you think together to help school authorities solve any one or all of the problems above?
Ideate: Students will now be asked to come up with different alternatives to resolve the issue of wastage of water and soil erosion.

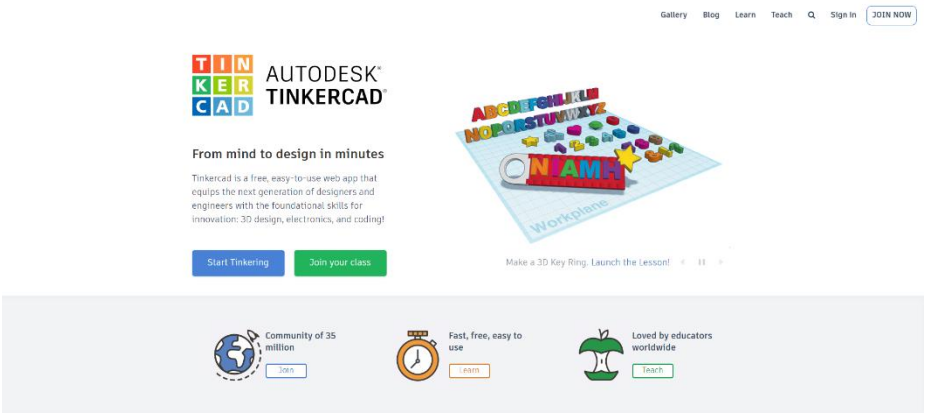
Stage 3: Making landscape using 3D printer and test the created landscape against water to test for soil erosion **- tinkering (Subject teacher and ATL in-charge)**

Aim:

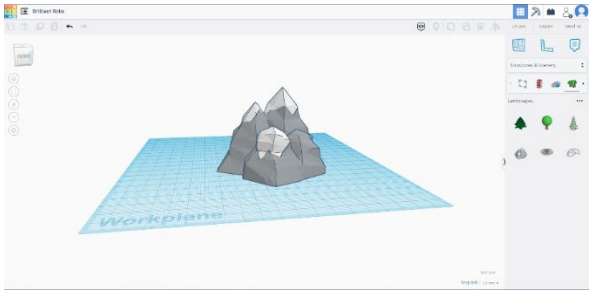
- To create a landscape by creating various landforms and 3d printing it.
- To test the created landscape against water to test for soil erosion
- To use sensors and AI to detect and determine which part of the created landscape will have the most fertility in it for the required crops.

The steps to do so are:

3.1 Open TinkerCad: https://www.tinkercad.com/



3.2 Sign-in to the account via TinkerCad.com
Go to the main plane of 3d model creation from the tool. From the plane section on the right-hand side, select the landscape and use the ready-made models of different landscapes to print. The basic tools can also be made available in the software to go ahead and create one's own customised landform as learnt and seen in the textbook.



3.3 Create 3 similar landforms and generate a **.stl** file for the same.
3.4 3d print all these 3 platforms from ATL 3d printer with the help of ATL Lab In charge.
3.5 Once 3 such different landforms are created, a small test landscape is built using a cardboard box.

3.6 The cardboard box is filled with sand in such a manner that the printed landforms can stay on the top of it. Now, place the 3d printed landforms in a box in such a manner that the least possible soil gets eroded.
Open Arduino Uno hardware and attach the soil sensor as mentioned in the image below:

Step by step Guide: https://create.arduino.cc/projecthub/Dynamic_Innovator/make-your-own-soil-moisture-sensor-with-arduino-9b3b89

Stage 4: Making AI enabled software to predict fertility and moisture of the soil (Subject teacher and AI Faculty)

4.1 Place two such setups on different ends of the cardboard box.
4.2 Start measuring the soil moisture as and when water flows and measure it in every 15 mins for the next 3 days.
Based on the data and entries received, fertility and moisture of the soil can be predicted simultaneously as to which crops are relevant here to be grown.
4.3 Use the two tools mentioned to enter and train the dataset for the collected data. The dataset can also be trained, even if a particular data is not collected, by downloading the already given database on the links to help understand how the AI and prediction of crop rotation works.
https://machinelearningforkids.co.uk/#!/pretrained
https://cognimates.me/home/
4.4 Try and involve the AI part to predict the crop rotation and rowing cycle for the landscape created.

Learning Outcomes	The learner ● Identifies and understands the action of the two types of forces upon the surface of the Earth. ● Comprehends the reasons for the changes on the surface of the Earth due to internal forces and external forces.

	• Understands the formation of mountains, plateaus and plains and differentiate between three of them. • Relates with water pollution and land degradation in real-life situations and suggests measures to prevent pollution and land degradation. • Gets familiar with 3D - Drawing and 3D Printing. • Comprehends Arduino Hardware and Coding in the IDE. • Applies AI to determine Crop Cycle.
Glossary	• **TinkerCad:** Tinkercad is a web app that equips with the foundational skills for 3D design. • **Arduino Uno:** is a microcontroller board based on the ATmega328P (datasheet). It has 14 digital input/output pins. • **Soil moisture sensors:** It measures soil moisture at the root zone and regulates the existing conventional irrigation timer, resulting in considerable water savings when installed and used properly. • **Data Acquisition:** Data Acquisition refers to acquiring authentic data from reliable and authentic sources/ platforms that is required for the AI model. There can be various ways to collect data.
Reference Links	• www.arduino.cc • https://towardsdatascience.com/tagged/arduino
Skill outcomes	**Tech skill** • Data gathering • Pattern recognition • Model optimization **Design thinking** • Ideation • Prototyping **AI Domain** • AI for Data **Mathematical and quantitative skills** • Probability • Statistical analytics **Physical computing** • Basic electrical and electronics. • Circuit building and knowledge of sensory network **Social impact solution building** • System mapping • Problem identifying • Problem scoping • Problem solving • Prototyping the AI and tinkering solution