STEP 3 – ENGINEERING

The following pages record some of the Engineering based tasks that our classes engaged in this year.

Here is a quick list of the activities in order of presentation completed by classes ranging from 1st to 4th

1. Sphero Robotics
2. Marble Runs
3. Rocket Design
4. Building Bridges
5. Strong Structures
6. Tallest Building
7. Build a Filter

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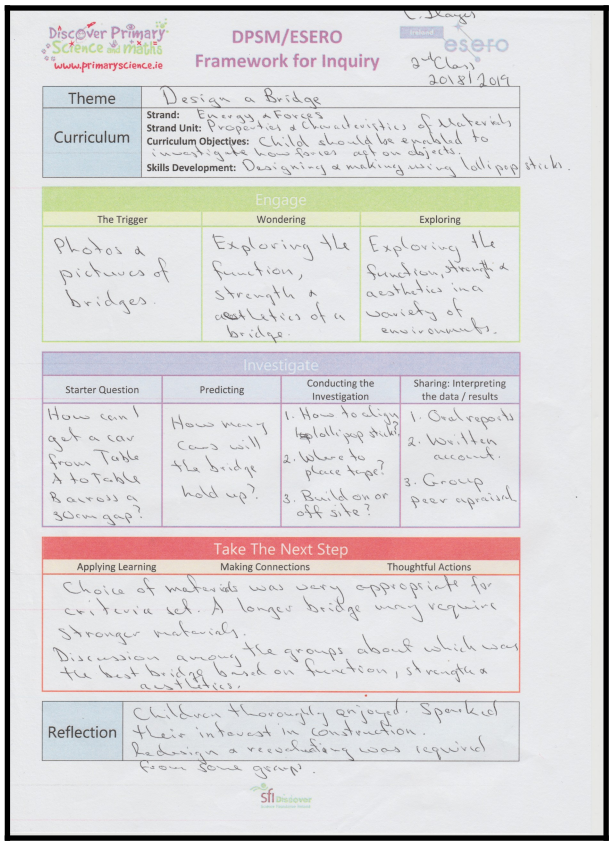

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DPSM/ESERO
Framework for Inquiry

esero

2nd Class
2018/2019

Theme	Design a Bridge
Curriculum	Strand: Energy + Forces Strand Unit: Properties + Characteristics of Materials Curriculum Objectives: Child should be enabled to investigate how forces act on objects. Skills Development: Designing + making using lollipop sticks.

Engage

The Trigger	Wondering	Exploring
Photos + pictures of bridges.	Exploring the function, strength + aesthetics of a bridge.	Exploring the function, strength + aesthetics in a variety of environments.

Investigate

Starter Question	Predicting	Conducting the Investigation	Sharing: Interpreting the data / results
How can I get a car from Table A to Table B across a 30cm gap?	How many cars will the bridge hold up?	1. How to align lollipop sticks? 2. Where to place tape? 3. Build on or off site?	1. Oral reports 2. Written account. 3. Group peer appraisal

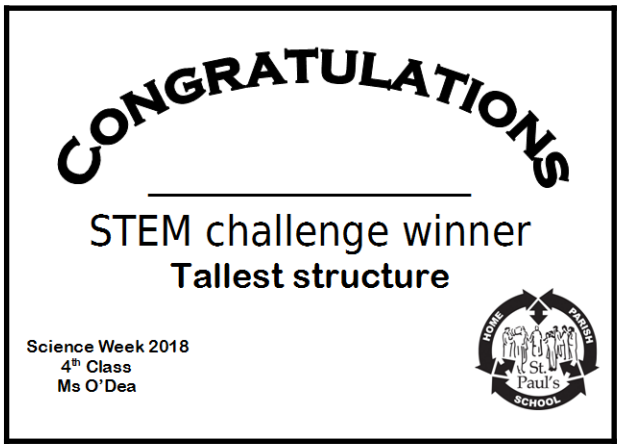
Take The Next Step

Applying Learning	Making Connections	Thoughtful Actions
Choice of materials was very appropriate for criteria set. A longer bridge may require stronger materials. Discussion among the groups about which was the best bridge based on function, strength + aesthetics.		

Reflection	Children thoroughly enjoyed. Sparked their interest in construction. Redesign + reconstructing was required from some groups.

Sfi Discover

Teachers used the DPSM framework to plan their lessons



CONGRATULATIONS

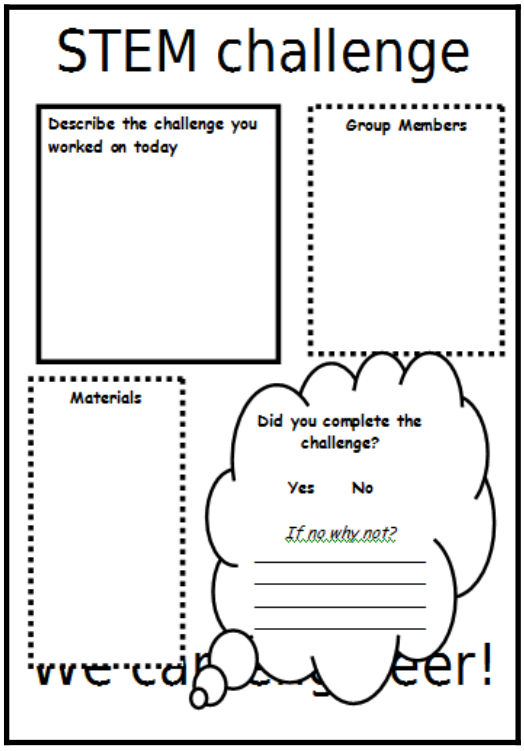
STEM challenge winner

Tallest structure

Science Week 2018
4th Class
Ms O'Dea

St. Paul's School

STEM certificates to reward good group work and engagement.



STEM challenge

Describe the challenge you worked on today

Group Members

Materials

Did you complete the challenge?

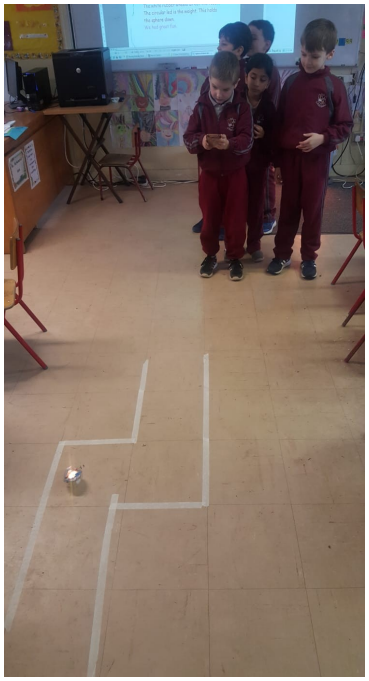
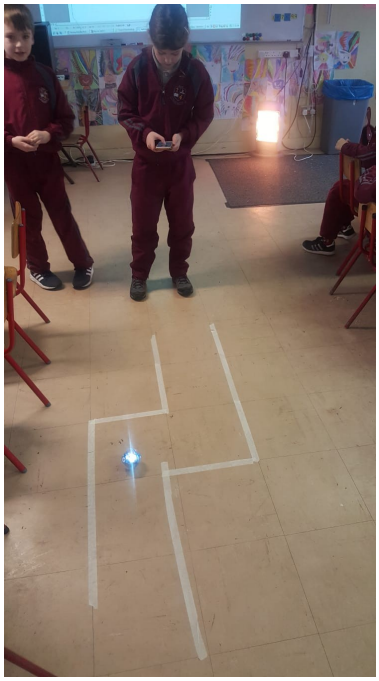
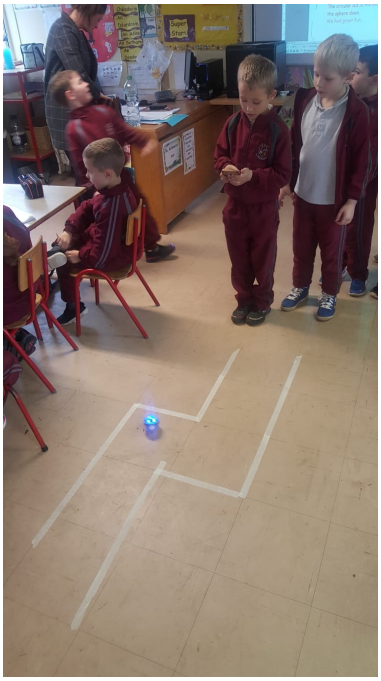
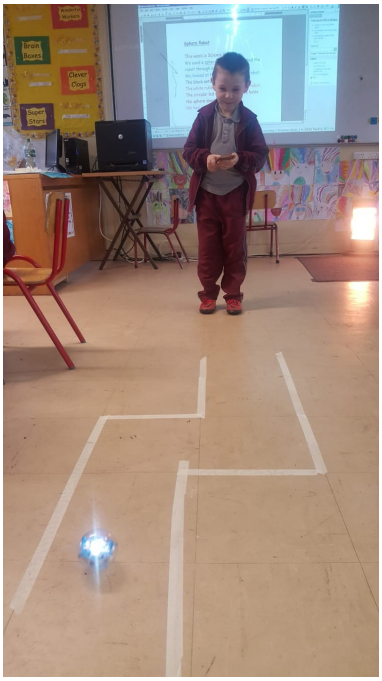
Yes No

If no why not?

STEM challenge planning templates to scaffold the pupils design and review of their ideas

1. SPHEREO ROBOTICS

Ms. A. McNamara's 1st class had great fun programming and operating their sphereos. They had to engineer their sphereo to negotiate a given path.

2. MARBLE RUNS

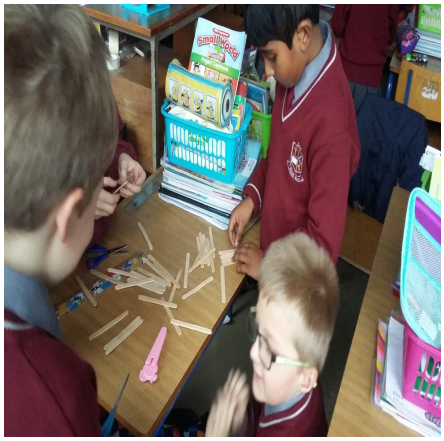
Mr. Hutton's 1st class worked in teams to design and make some very complex marble runs.

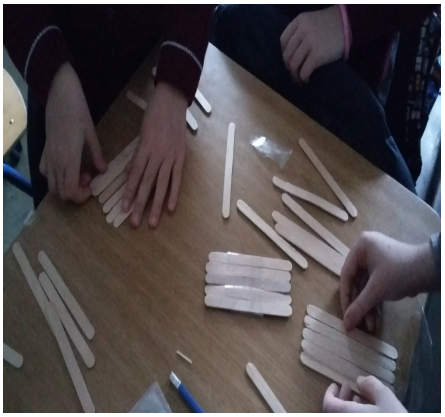
3. ROCKET DESIGN

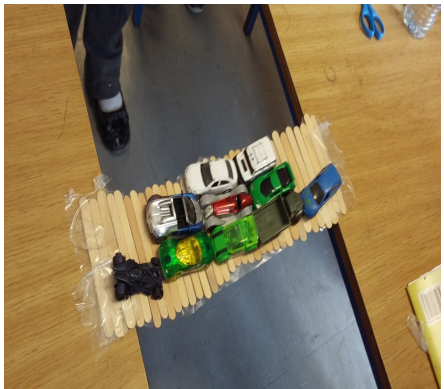
Ms. D. Cullinane's 1st class built some pretty aerodynamic rockets.

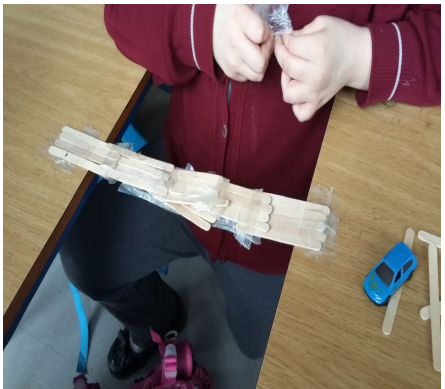
4. BUILDING BRIDGES

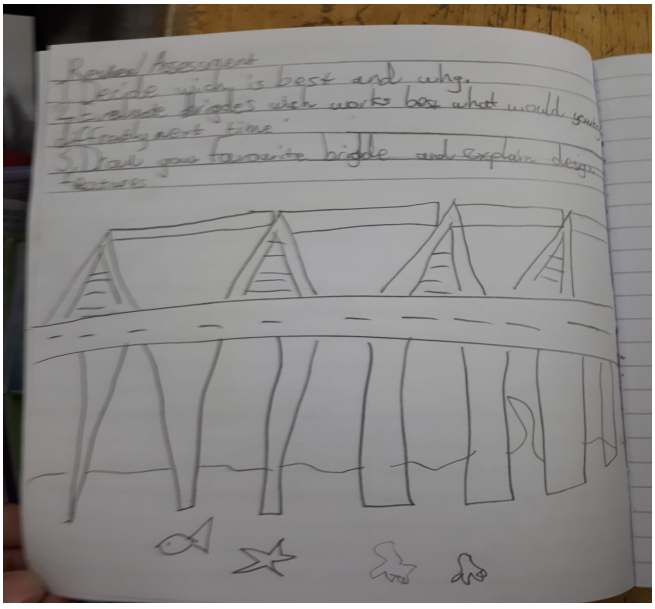
The 4th class engineers of Mr P. O'Brien, Ms. C. Hayes and Ms. M. Toomey had to design and create bridges with a given design brief. The bridges had to made from lollipops and to span a given distance. The bridge that could support the most toy cars won. The classes all came up with some great designs.

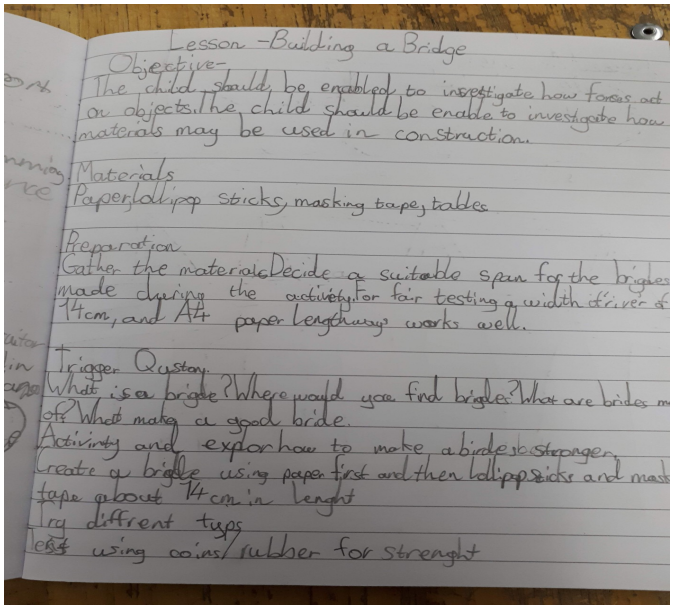


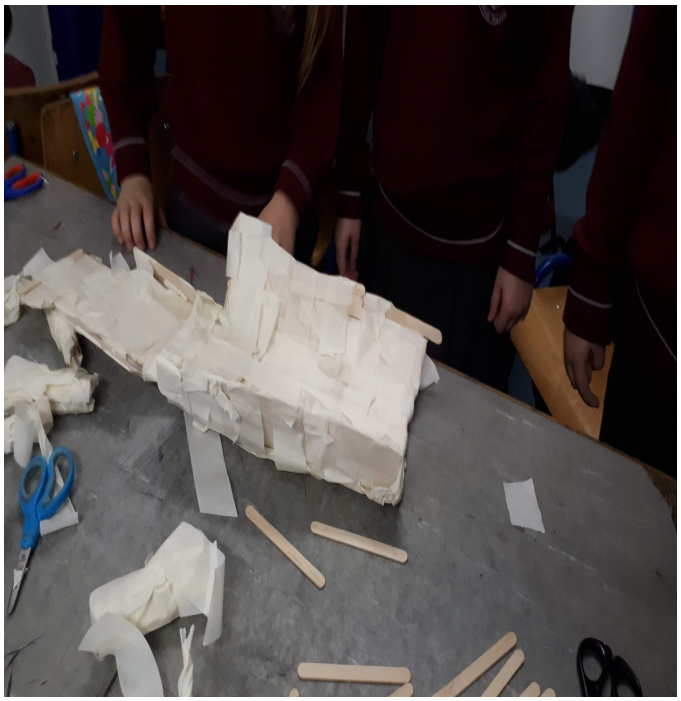






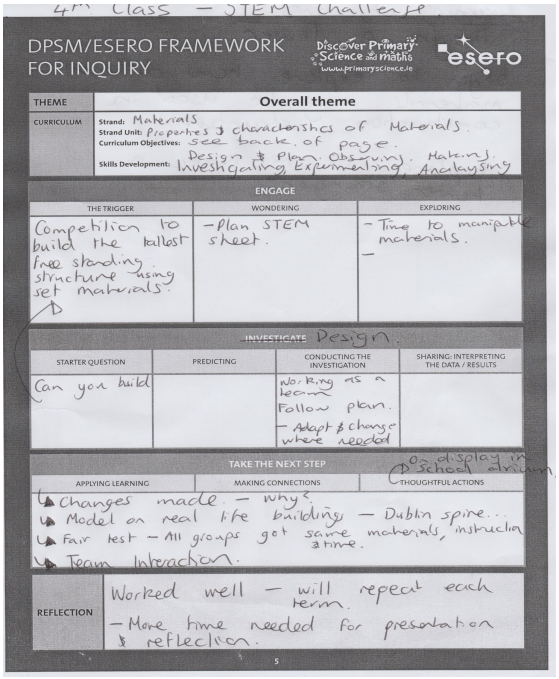

Review/Assessment
1. Decide which is best and why.
2. Evaluate bridges wich works best what would you
Differently next time
5. Draw your favourite bridge and explain design
Features


Lesson -Building a Bridge
Objective-
The child should be enabled to investigate how forces act on objects. The child should be enable to investigate how materials may be used in construction.
Materials
Paper, lollipop sticks, masking tape, tables
Preparation
Gather the materials. Decide a suitable span for the bridges made during the activity. For fair testing a width of river of 14cm, and A4 paper lengthways works well.
Trigger Qustory.
What is a bridge? Where would you find bridges? What are bridges m
of? What make a good bride.
Activity and explor how to make a bridge stronger.
Create a bridge using paper first and then lollipop sticks and mask
tape about 14cm in lenght
Try diffrent typs
Test using coins/rubber for strenght



6. Tallest Building (Free Standing Structure)

Ms. N Barron and Ms. N. Walsh's 4th classes competed in a STEM challenge to make the tallest freestanding structure using just masking tape, newspaper and card.



4th Class – STEM Challenge

DPSM/ESERO FRAMEWORK FOR INQUIRY

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THEME	Overall theme
CURRICULUM	Strand: Materials Strand Unit: Properties & characteristics of Materials Curriculum Objectives: See back of page. Skills Development: Investigating, Experimenting, Designing & Planning, Observing, Making, Analysing

ENGAGE

THE TRIGGER	WONDERING	EXPLORING
Competition to build the tallest free standing structure using set materials.	- Plan STEM sheet.	- Time to manipulate materials.

INVESTIGATE Design

STARTER QUESTION	PREDICTING	CONDUCTING THE INVESTIGATION	SHARING: INTERPRETING THE DATA / RESULTS
Can you build		Working as a team Follow plan. - Adapt & change where needed	

TAKE THE NEXT STEP - display in school atrium

APPLYING LEARNING	MAKING CONNECTIONS	THOUGHTFUL ACTIONS
Changes made – why? Model on real life buildings – Dublin spire.. Fair test – All groups got same materials, instruction & time. Team Interaction.		

REFLECTION	Worked well – will repeat each term. - More time needed for presentation & reflection.

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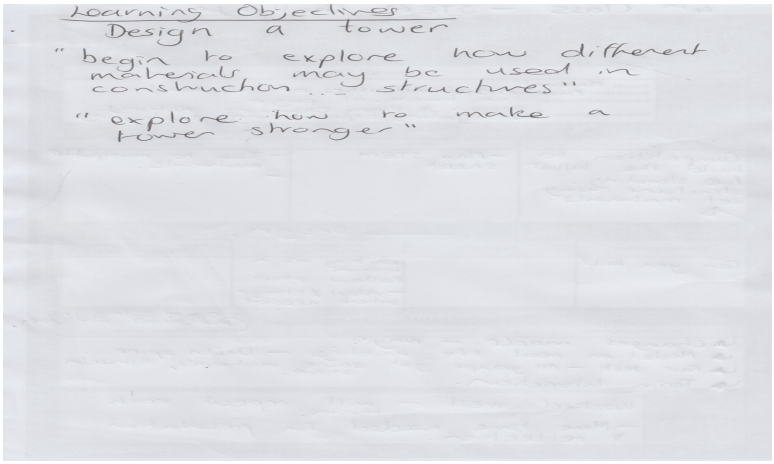
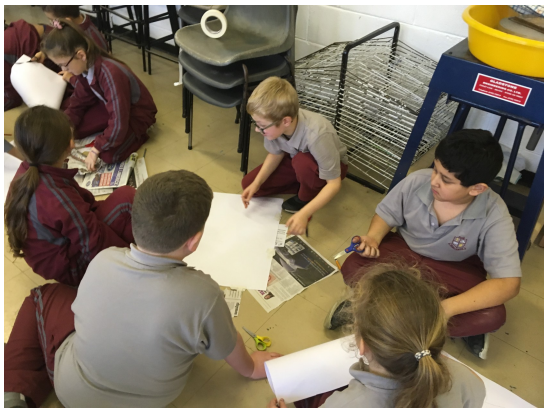


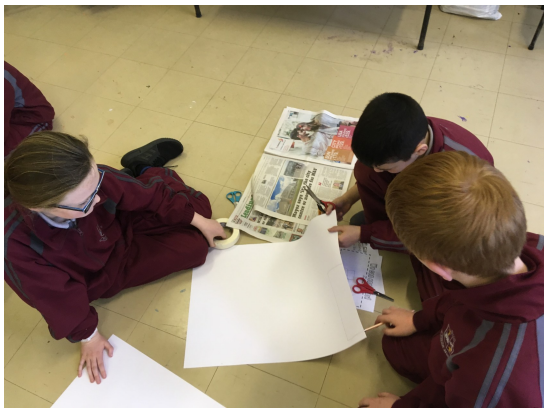
Learning Objectives

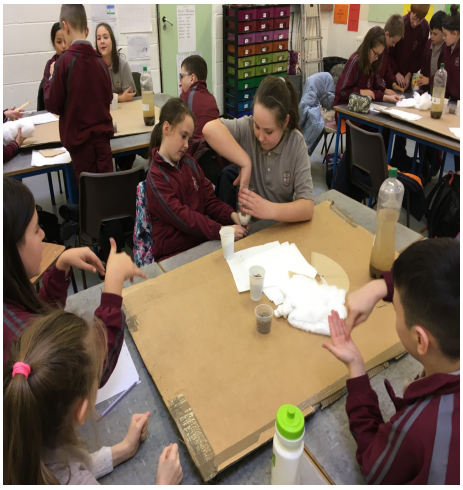
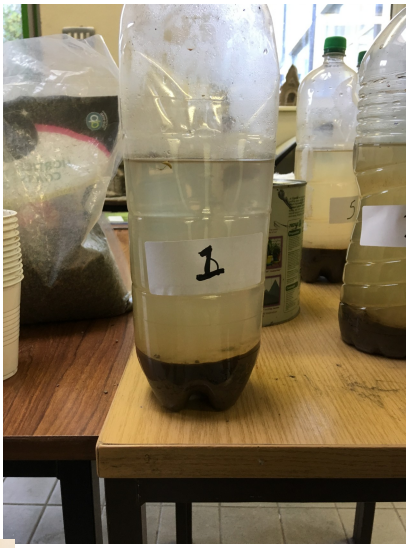
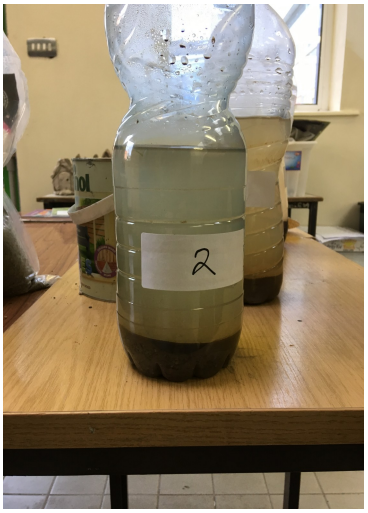
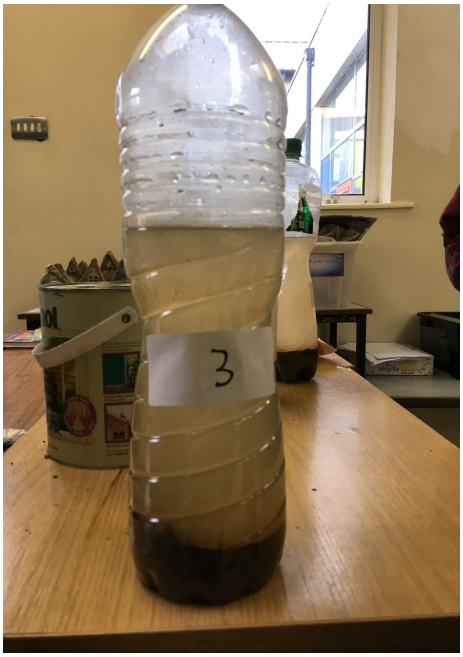
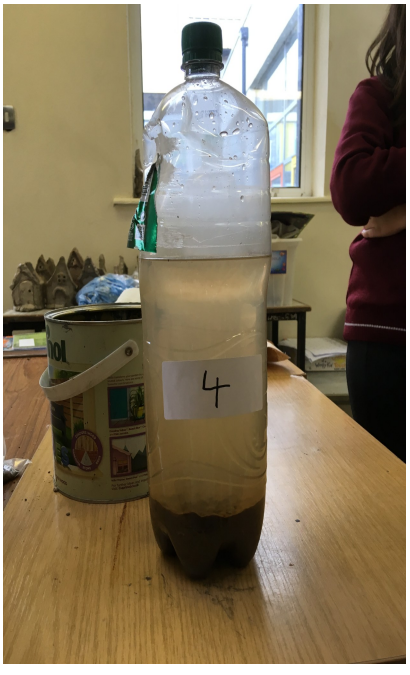
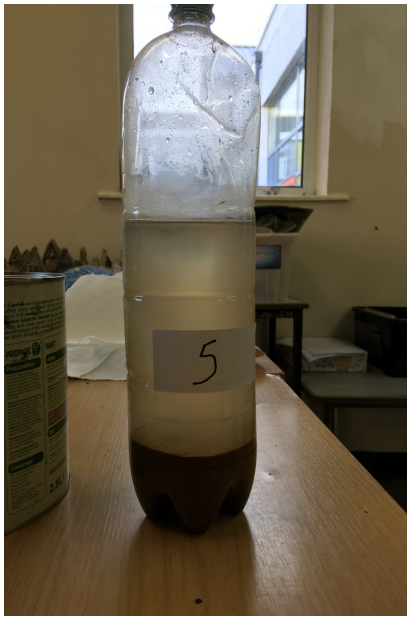
Design a tower

"begin to explore how different materials may be used in construction structures"

"explore how to make a tower stronger"





7. Design a Filter

Mr. O'Brien's 4th class were given some sand, filter paper, some pebbles, some muslin and some dirty water. They had to work in groups to design a filter that would clean the water effectively.