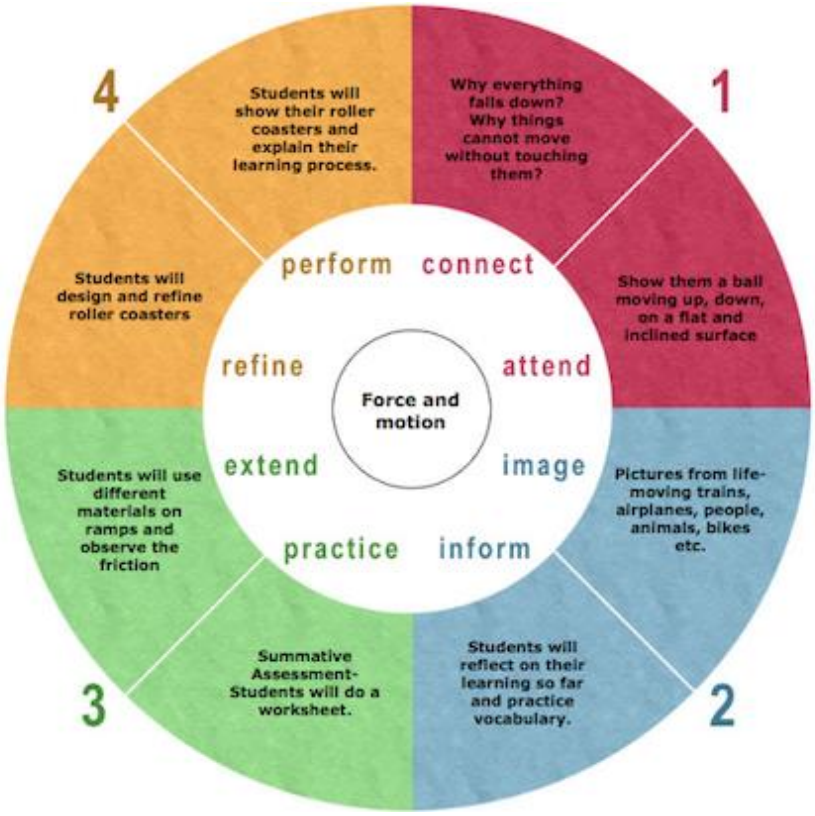
Lesson Plan Primary

Topic: Force and Motion **Grade: 2** **Time: 1 hour**

Big Idea (Students will understand): Forces influence the motion of an object **Core competencies/21st-century skills: Communication:** Students will generate a hypothesis, make predictions, and test their predictions. Throughout the process, they will communicate their understanding in any modality respecting the audience. The whole process of this involvement and care about other people (taking turns, only one person speaks at a time, etc.) during the lesson will foster positive personal and social identity. This lesson is an inquiry lesson, where critical and creative thinking is an essential part of the learning experience to be successful.



1. Connect and Attend: (10 minutes)

Teacher's Role – Motivator and Witness, Method-discussion, Question to be answered – Why?

The objective is to allow the learners to enter into the experience, to engage them, and to integrate the experience with personal meaning. Thus, teacher will try to create an opposite and fun **experience (Demos/Experiments)** for students asking some fun **inquiry questions**, such as, I am going to put this ball on this table, and we will see if my magical words can move this ball. No one can touch this ball. Other important question can be I hypothesize that if I hold the ball at some distance from the Earth, it may go upward, downward or sideways, what do you think? Students already know that ball can only go downward because of gravity but this will help them recall their past experience, connect that to school and prepare them to go further from the basic information. Students should now be able to predict that a ball needs force to move otherwise it won't move.

Comment [SG1]: Eliciting prior knowledge, exposing mental models of students – Zone of potential construction

The teacher can do another demonstration to find out the effect of air resistance on freely falling objects-

https://youtu.be/aRSHbHFJoXU

Comment [SG2]: Creating cognitive dissonance

After these **demonstrations**, students will draw upon their past experiences and do **in-class experiments** to answer the following question via a group dialogue-

1. **What are different ways that objects can be moved?**
2. **How do different materials affect the motion of an object**

Comment [SG3]: Devising incisive questions, providing a classroom atmosphere conducive to the discussion

Students can record their reflections in a journal (pictures/words/pictures and words) or as a voice/video note.

Content (Students will know): Students will learn about balanced and unbalanced forces such as motion caused by different strengths of force, effect of air resistance on freely falling bodies.

Curricular competencies (Students will do): Questioning and predicting, communicating

2. Image and Inform: (15-20 minute)

Teacher's Role – Conceptualizer and "Teacher", Method – Imaging and direct instruction, Question to be answered – What?

It is the place where they link their personal, subjective experience with the objective, analytic world of the content at hand. Students will now move to deep reflection. Thus, they will focus on finding out different types of forces by analyzing different objects such as different types of vehicles (e.g. trains- diesel, electric, magnetic), people, bikes etc. Students will revise the content they learned in stage one and move towards more in-depth understanding of contact forces and at-a-distance forces. The teacher may provide organized direct instruction to explain how different types of forces work with visuals

Comment [SG4]: Choosing materials and activities for pupils to test ideas

and **hands-on fixed variable experiments**. This stage is very helpful for **students with learning differences**.

Content (Students will know): Static and Magnetic forces

Curricular competencies (Students will do): Processing and analyzing data and information

3. Practice and Extend: (10 minute)

Teacher's Role – Resource and coach, Method – Facilitation, Question to be answered – How does this work?

Students will do a verbal test on the vocabulary and concepts they have learned so far. After mastering the basics of Force and Motion, now students are going to **experiment with all the available materials** to challenge their understanding (**to create disequilibrium**). Students will explore the **effect of friction on motion by moving different objects on different materials such as moving a ball on different materials (may need a ramp with different types (different amount of friction) of clothes) such as clothes, ice, water, sand etc.**

Content (Students will know): the way different objects move on different materials.

Curricular competencies (Students will do): Evaluation, applying and innovating

Refine and Perform: (20 minute)

Teacher's Role – Evaluator/Remediator and Co-Celebrator, Method – Evaluation and Self – Discovery, Question to be answered – What If?

Refine is the step where the learners are asked to analyze what they have planned as their **"proof" of learning**. This analysis should be based on:

Roller Coaster Workshop: students will design a roller coaster based on their understanding of how ramps work, forces, push, pull, friction etc. The teacher may intervene and question/explain the concept to **scaffold** the concepts further while students are designing the roller coaster. The teacher may invite other teachers and admin to showcase students' success. Along with that, students need to reflect upon their learning in their Journals.

Materials for Roller Coaster Workshop: vacuum cleaner pipe pieces, a big table, small wooden cubes and clamps to hold the pipe up and down, small iron ball (coaster).

Content (Students will know): Nothing new

Comment [SG5]: Addressing learning differences.

Comment [SG6]: Choosing materials and activities for pupils to test ideas

Comment [SG7]: Provide opportunities for pupils to utilize new ideas, application of new knowledge with feedback

Comment [SG8]: Reflection on learning

Curricular competencies (Students will do): Communicating, Planning and conducting, performing

Assessment: This age group learns by playing and may record their observations in their journals or just prove verbally. Students do not need to go through rigorous summative assessment procedures; rather, formative assessment during all the stages is sufficient.

References:

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