Strategies and Activities on Mole Calculations

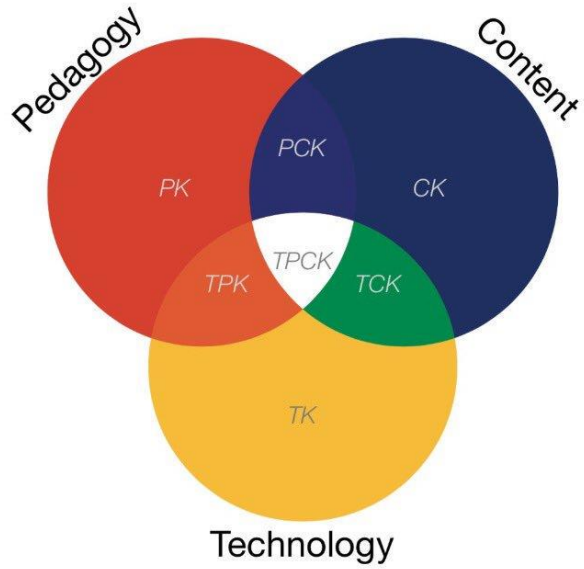
30 NOVEMBER 2017

Background

Existing resources / strength

- ✓ PhET Simulations, Google Form, EDpuzzle, YouTube videos, Flipped learning, Personal Response System (PRS) / clickers
- ✓ Teachers' sharing, focus group meetings
- ✓ Experiments, annotated questions

Technological Pedagogical Content Knowledge (TPCK)
Integration of knowledge of subject matter (content), what is good for learning (pedagogy) and ICT (technology)



Objectives of trying the three strategies/activities on mole calculations

- To enhance students' understanding in mole concept and tackle students' learning challenges
- To promote self-directed learning
- To practice on the integration of e-learning tools in teaching to support and enhance students' learning

Strategies:

1. Students to design and explain questions
2. Pre-experimental assignment in Google Form and practical activity
3. PhET simulation and concept test

Strategy 1 – Students to design and explain questions

S: In groups of 3 to 4, design questions (MC and/or conventional questions) on Reacting Masses

S: Submit questions with fully worked out solutions, explanations for answers and distractors

T: Check students' questions and provide feedbacks

S: Revise questions based on teacher's feedbacks

T: Select and compile the questions into a revision test

T: Choose the "winning team" and select groups to present their questions to class after the revision test

Strategy 2 – Pre-experimental assignment in Google Form and practical activity

T: Prepare and send pre-lab questions via Google Form to students
S: Complete the questions before the practical lesson

T: Go through the students' answers before the practical lesson to prepare for the pre-lab discussion

T: During the practical lesson, discuss the questions and answers with the class

S: Conduct the experiment, complete the questions and calculations in the manual

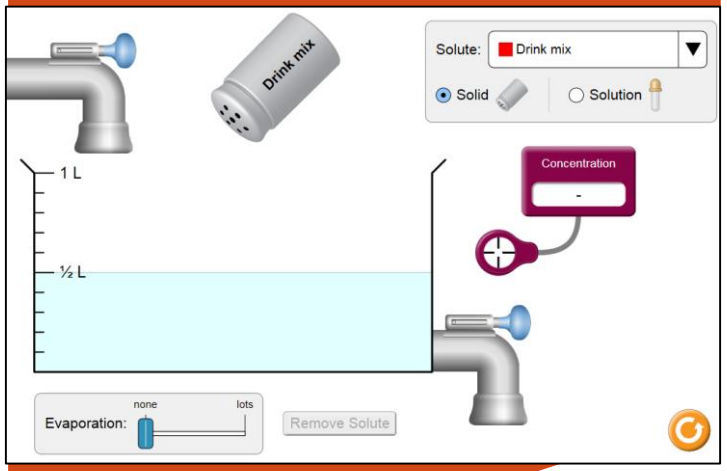
Strategy 3 – PhET simulation and concept test

Preparation:

- Each student / group of students should be provided with a mobile device for viewing simulation
- Download “Plickers” in your own device; create class in Plickers and distribute Plickers cards to students
- Prepare questions in Plickers

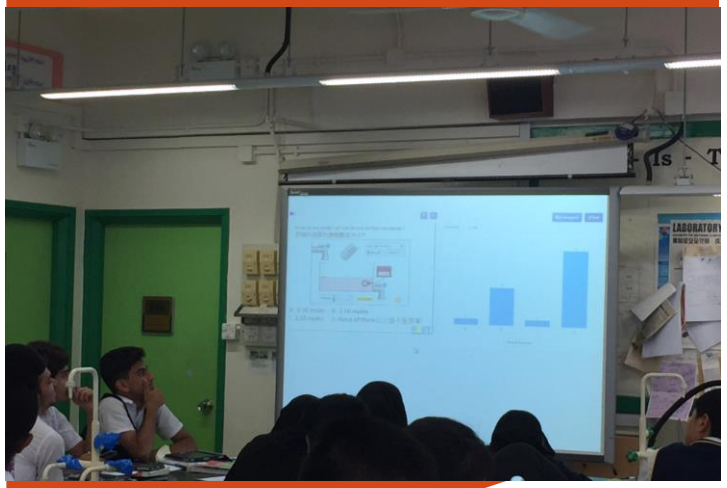
Part 1 – PhET simulation

Exploring the concept of concentration with the simulation in class

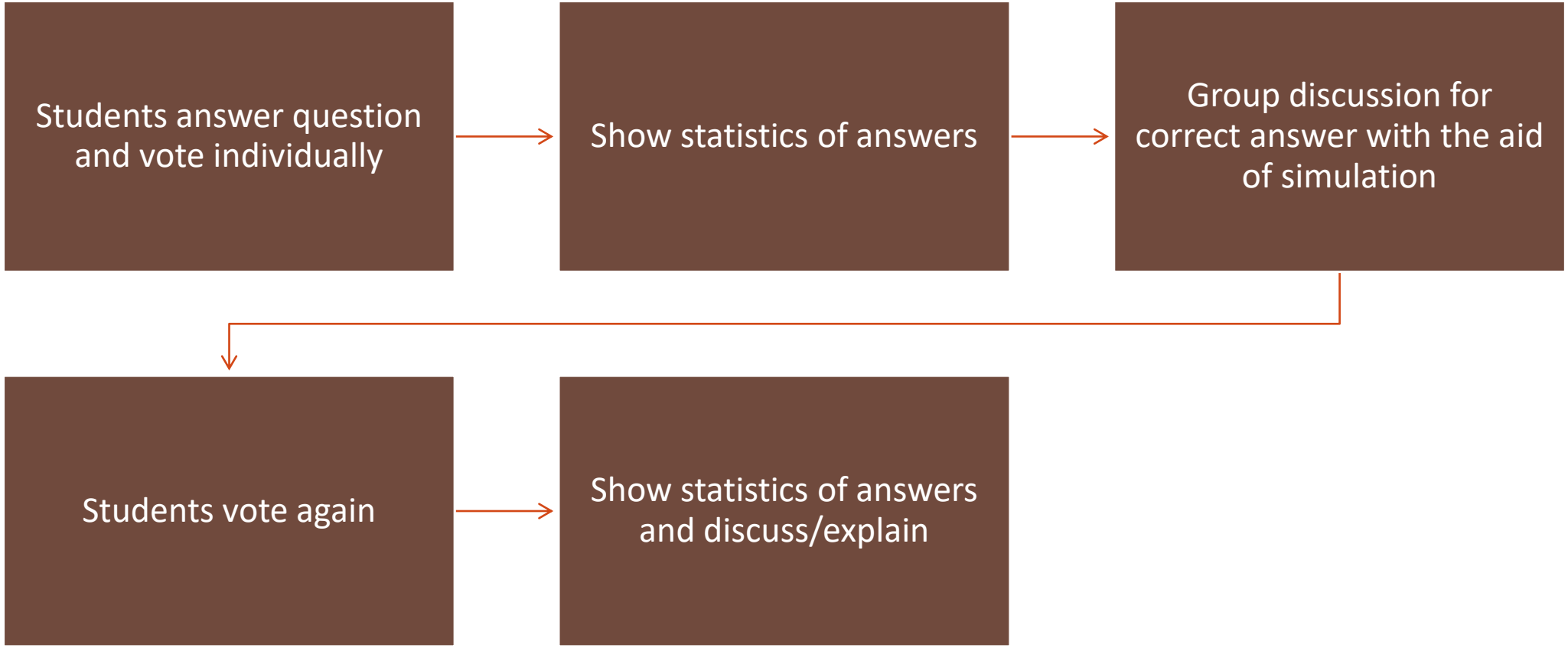


Part 2 – Concept test

Conduct learning activity for each concept test question using Plickers



For each question of concept test



Arrangement for the try-out session

- ✓ Try-out period: Dec 2017 – Apr 2018

- ✓ Submission of post-activity surveys:

  - Students' survey (scanned students' questionnaires or screen-captured summary of Google Form responses)
  - Teachers' survey (teacher's questionnaire in Word file or fill out the web-based survey in Google Form)
  - Deadline for submission: 30 April 2018