

科學教育：新挑戰與新機遇

Science Education:

New Challenges and New Opportunities

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New Challenges

- A. Newly joined IS Colleagues
- B. Learner's Needs (post-pandemic needs)
- c. Technological Advancement



New Challenges

A. Newly joined IS Colleagues

School-based Support

Subject-based Support

Collegial Support



New Challenges

Junior IS Teaching & Learning Support

- I. Lesson Planning Framework
- II. Teaching Resources Pool
- III. Knowledge Management System



II. Teaching Resources Pool



The screenshot shows the EdCity website banner. The header includes the EdCity logo and navigation links for 'About EdCity', 'Teacher', and 'Student'. The main text reads: "Embark on Your Journey to New Realms!" followed by "Phase 2 with Brand-new Challenges are Ready!". Below the text are several colorful icons representing different educational resources and activities.

The screenshot shows the 'Teaching Resource Centre' website. It features a banner with a colorful fish and coral reef image. Below the banner, there are navigation tabs for Lesson Preparation, Multimedia Resources, Continuous Assessment, and STEM. The text 'What's new' is visible, along with the date '03/02/2023' and a note: 'Science News File is uploaded (MS Word & PDF)'.



III. Knowledge Management System


CHRISTIAN & MISSIONARY ALLIANCE SUN KEI SECONDARY SCHOOL

Integrated Science S1 Homework schedule

5 Energy

Cycle	Topic	Pre-Study	Pre-Exercise	Challenging Activity/ question:
17B	5.1 Energy changes P.81-91	P.85	Checkpoint 1 (P.85) Quizlet 5.1	Apart from the seven forms of energy introduced in pg.82-84, suggest other forms of energy and use less than 50 words to describe it.
18A	5.1 Energy changes P.92-101	P.97	Checkpoint 2 (P.100-101) 	What are perpetual motion machines? https://www.youtube.com/watch?v=jsxroTt9IhY
18B	5.2 Heat transfer A. Conduction B. Convection P.102-112	/	Checkpoint 3 (P.106) Checkpoint 4 (P.112) Quizlet 5.2	<ul style="list-style-type: none"> Suggest why an air-conditioner is always situated near the ceiling? Why hot air rises while cool air sink?
19A	5.2 Heat transfer C. Radiation 5.3 Energy sources A. Fossil fuels P.113-124	P.123-124	Checkpoint 5 (P.119) Quizlet 5.3A 	What is greenhouse effect? Is it a good or bad thing? Watch video: Building the world's largest power plant https://www.youtube.com/watch?v=dcZ0BXJYIU
19B	5.3 Energy sources B. Alternative energy sources P.125-133	/	Checkpoint 6 (P.133) Quizlet 5.3B 	Watch video: Journey Inside Chernobyl's Exclusion Zone Short Film Showcase Link: https://www.youtube.com/watch?v=UrbTTrgLB5A Search more information about nuclear accidents.

2/5/2023 Form Quiz 3 Unit 5 Energy

Cycle	Topic	Pre-Study	Pre-Exercise	Challenging Activity/ question:
17B	5.1 Energy changes P.81-91	P.85	Checkpoint 1 (P.85) Quizlet 5.1	Apart from the seven forms of energy introduced in pg.82-84, suggest other forms of energy and use less than 50 words to describe it.
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18B	5.2 Heat transfer A. Conduction B. Convection P.102-112	/	Checkpoint 3 (P.106) Checkpoint 4 (P.112) Quizlet 5.2	<ul style="list-style-type: none"> Suggest why an air-conditioner is always situated near the ceiling? Why hot air rises while cool air sink?

New Challenges

B. Learner's Needs (post-pandemic needs)

- I. Learning motivations (passive?)
- II. Affective emotional dimension of science learning (Davidson et al., 2020)
- III. Learning habits (tech-savvy?)
- IV. Mistrust & misinformation in science (OECD, 2019)
- V. Social skills (schools' suspension?)



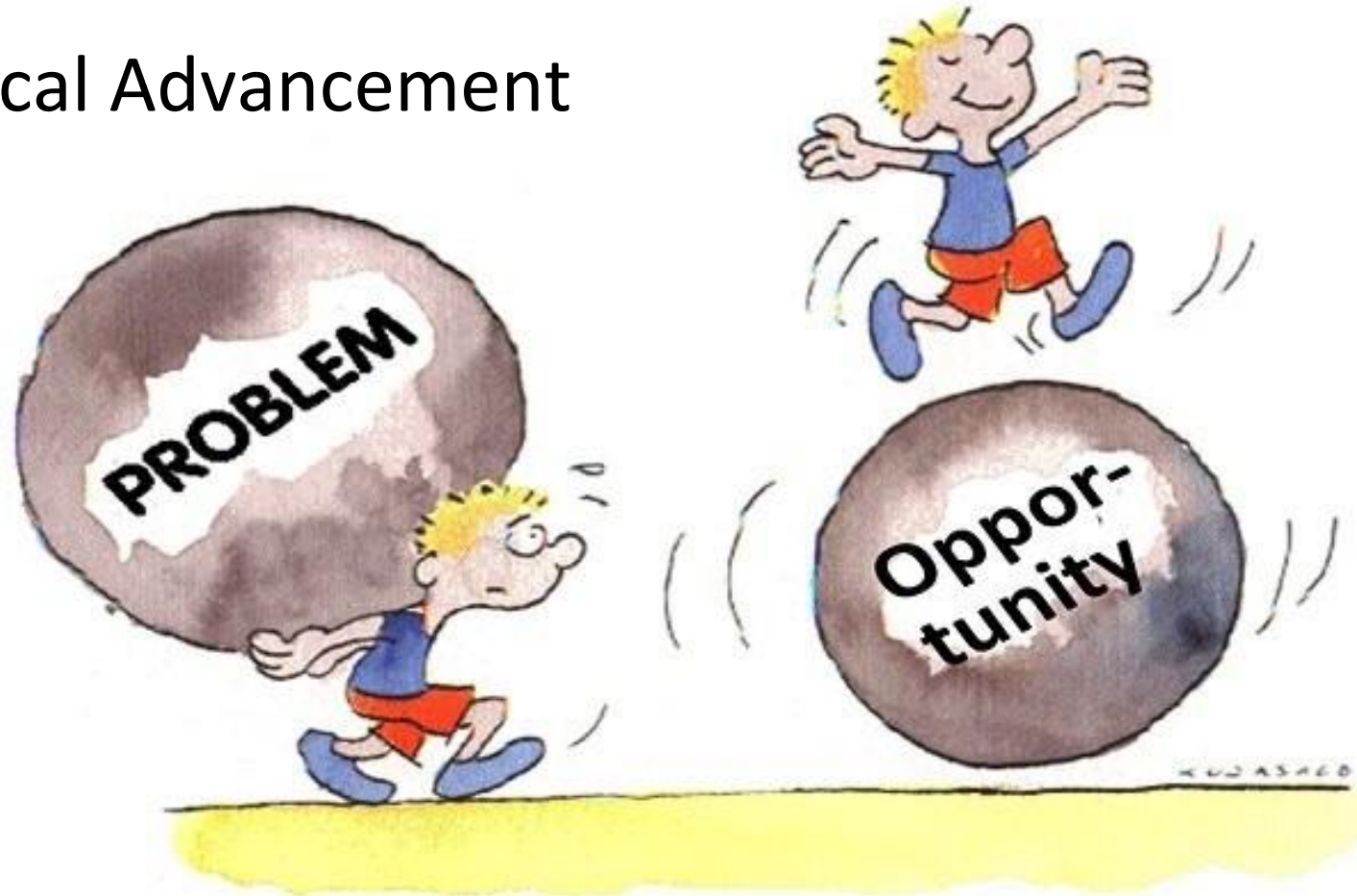
Handy Teaching gadgets

Magdeburg Hemisphere
马德堡半球



New Challenges

C. Technological Advancement



11.1 Motion

11.5 Action and reaction

6.1 The particle theory

8.3 Resistance

5.1c Motor and dynamo

11.2 Force

6.4 Thermal expansion and contraction

6.6 Density

11.4 Friction and air resistance

6.2 Properties of solids, liquids and gases

5.4 Energy sources

2019-2020 (S1)

2020-2021 (S2)

Limited Practical Work

Science Teaching in Post-pandemic

- What are the students' IS learning experience in the past two year?
- How to enhance students' motivation in science?
- How to bridge P6 to S1 in science learning?
- How to promote science learning atmosphere at school?
- How to attract students to opt science-related electives in DSE?
- Any teaching plans to cope with half-day or full-day school?

Students' learning experience are **personalised**
(**diverse and different**)

5 Take Away

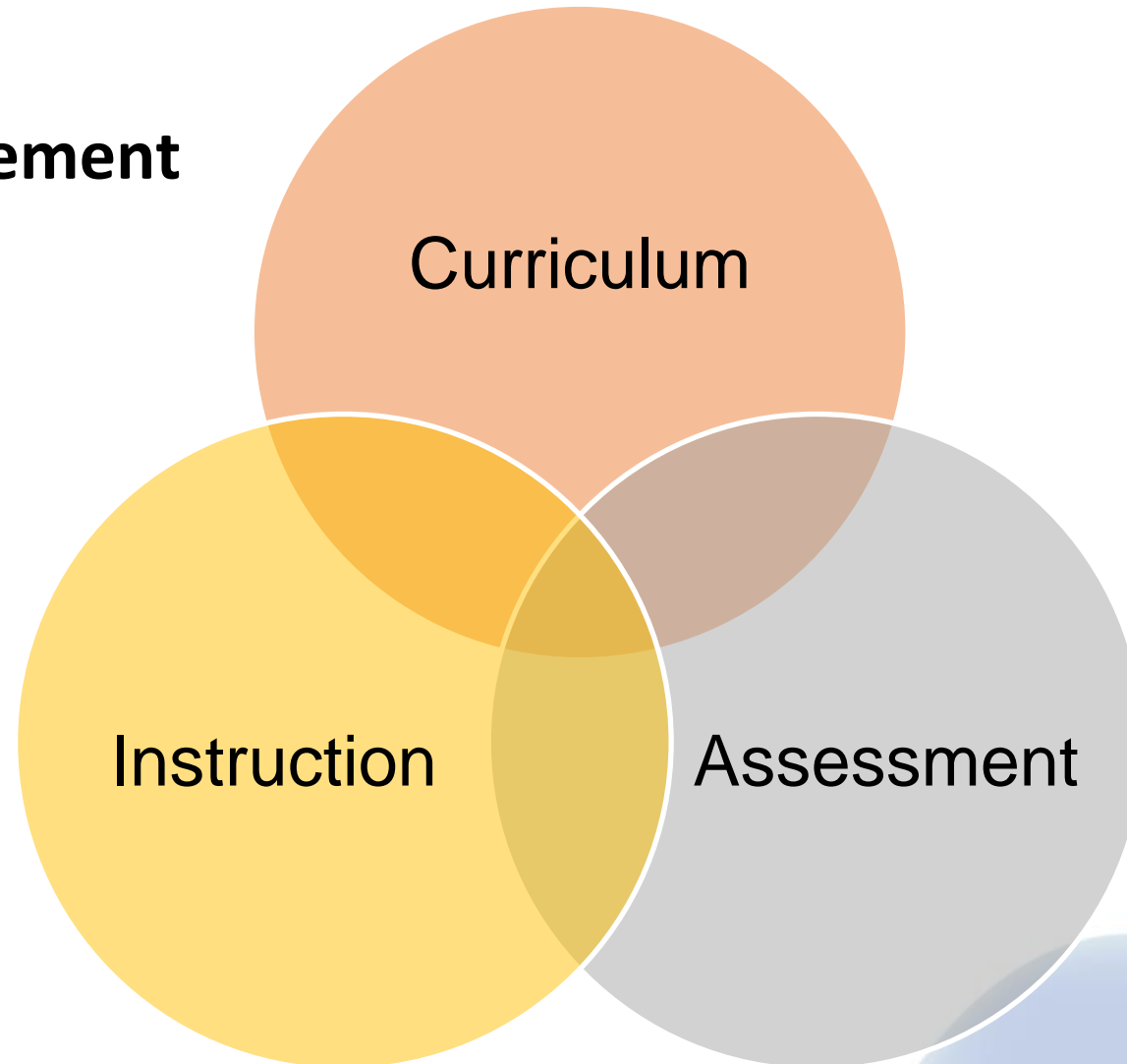
Students' learning experience are *personalised*
(diverse and different)

Opportunities to...

- 1) Collaborate and Support Junior IS teachers
- 2) Facilitate *Personalized student learning* (learning videos)
- 3) Develop *Virtual-support* Real-time Practical Work
- 4) Launch take-home Inquiry/STEM/STEAM Project (Doing science, writing science and *talking science*)
- 5) Enrich *21st century skills and growth mindset*

New Opportunities

A. Technological Advancement

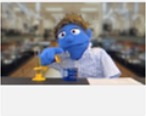


Lesson wrap-up quiz (Quizizz)

Browse from millions of quizzes

在 Quizizz 庫中搜索

試題 極好的



Lab Safety Quiz

11th - 12th 年級 • Science
86% 準確性 • 381 測驗

Vanessa Ramirez
7 個月

工作表 複製並編輯

極好的 資源

這個 試題 使用了一些超級內容，升級到超級計劃，將其分配給您的學生。

獲得免費超級試用

由指導老師引導的課堂
開始線上實時測驗

非同步學習
指派作業

Using mastery mode improves student recall and concept clarity by 20% 就是這樣

18 個問題

顯示答案 預覽

1. 選擇題 30 秒 尚未打分數

Q. If a laboratory fire erupts, immediately _____.

- Run for the fire extinguisher.
- Notify your instructor.
- Throw water on the fire.
- Open the windows.

給你的建議

更多資訊

Lab Safety
3.4K 測驗
第三名
10 Qs
Science

Lab Safety
9.7K 測驗
5日 - 6日
14 Qs

Lab Safety
200 測驗
第四名 - 5日
17 Qs
極好的 課

Lab Safety
2.6K 測驗
5日 - 8號
10 Qs

建立自己的測驗

創建一個新測驗

Curriculum

Assessment



Flipped experiment video

Curriculum

Assessment



Flipped classroom

Section 1 of 7

Science – Flipped classroom worksheet 1.4

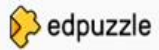
Book 1A Unit 1
Section 1.4 Laboratory apparatus and basic practical skills (p. 40)

Name: *

Short answer text

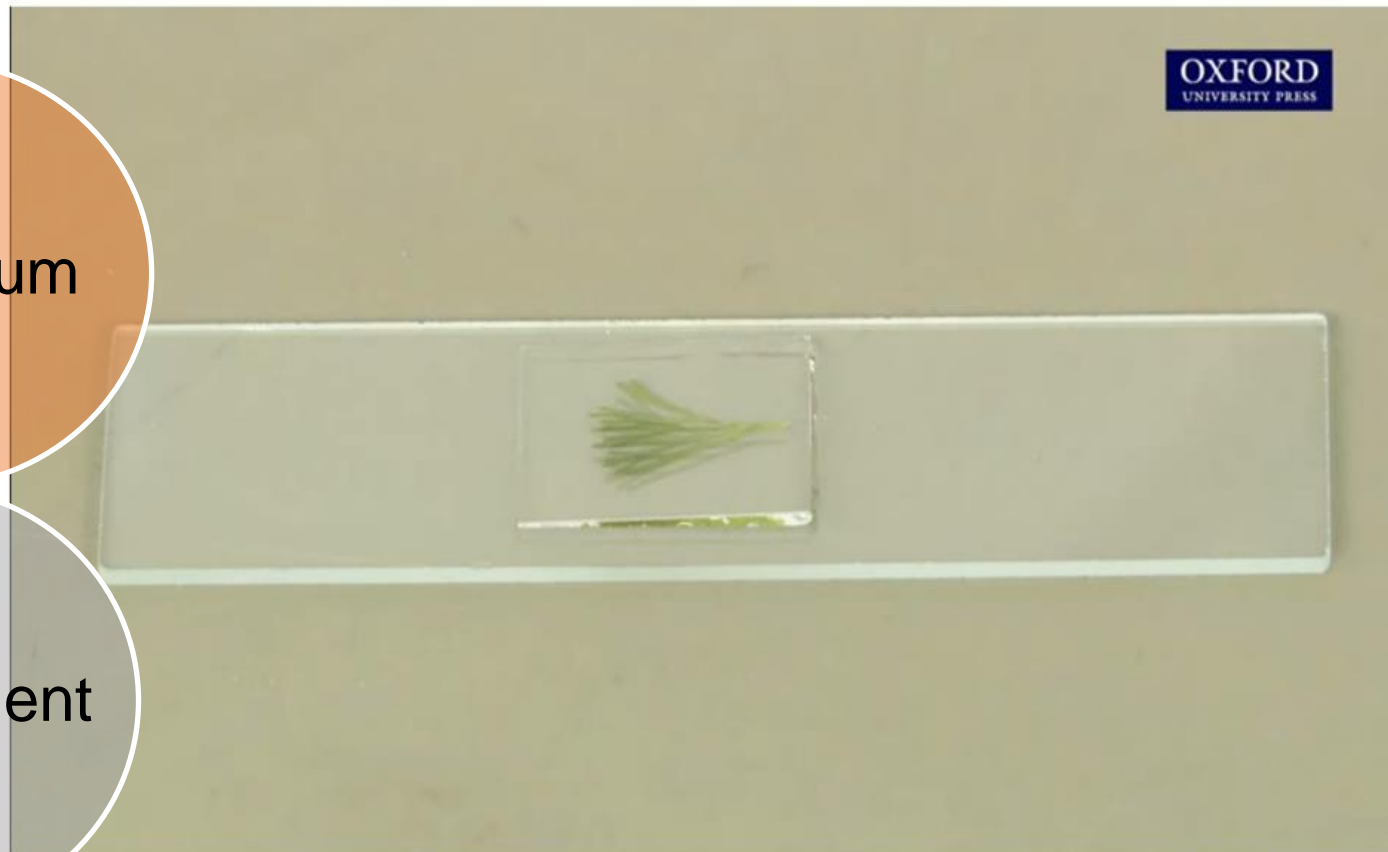


Interactive Video



Interactive video - Practical 4.3 Observing plant cells (Skills: using a light microscope, making a slide)

Oxford University Press China Ltd



⚠ This is a preview. Your answers won't be saved

☰ MULTIPLE CHOICE QUESTION

0 out of 100

Which of the following about the steps in preparing the slide of the leaves is/are correct?

(You may choose more than one answer.)

- Place the leaves onto the centre of a slide.
- Add a drop of iodine solution to the leaves.
- Lower the cover slip over the leaves on the slide slowly.

Rewatch

Skip

Continue

Curriculum

Assessment

Self-directed investigation of Fair testing



Curriculum

Assessment



Self-directed investigation of Fair testing

問題 回覆 125 設定 總分數

7. Take photos of the set-up and processes of the test. *

新增檔案 查看資料

Photo *

新增檔案 查看資料夾

Video

新增檔案 查看資料夾

8. What are the steps of the test? *

詳答文字

9. What are the results of the test? (You may draw a table to record the results and upload the photos of the table and results if any. *

新增檔案 查看資料夾

Curriculum

Assessment

Full name:	Chan Man Hei Makis	
1. Aim of the test.	To find out which noodles is heavier after soaking the water in the same time.	2
2. Setting a question:	Do fried egg noodles is the most heaviest after soaking the water in the same time?	3
3. Proposing a hypothesis	Fried egg noodles is heavier than rice noodles and soba noodles after soaking the water in the same time.	3
4. What are the independent variable of the test?	Fried egg noodles	1
5. What is the dependent variable of the test?	The weight of the noodles after soaking water.	3
6. What are the controlled variable of the test?	The size and shape of the bowl, the weight of the noodles, the temperature of the water, etc.	3
7. Take photos of the set-up and processes of the test.	https://drive.google.com/open?id=18O-XLdT6Heu-Yc_ZEfas5iSqZ11kRy4u	3
Photo 2	https://drive.google.com/open?id=1TGji2xiSiMPCrNVVysj_pg42MrpFUfppg	
Photo 3	https://drive.google.com/open?id=1z65rCYz8gTDxp--y_hrbTBGfluyZVW9K	
Photo 4	https://drive.google.com/open?id=1-S5eQNe3Q6wXqv1vUs-OyqOubCFtW6g	
Photo 5		
Video	https://drive.google.com/open?id=1j7j2IEIhB-VUvclwTkZA9BPEu2gjj_7H	
8. What are the steps of the test?	First, set-up the bowls, electronic scale, noodles... Then, put 300g of hot water into the measuring cup. Then, check the temperature of the water and make sure the water is over 75°C. Then, use the electronic scale to measure every noodles are 100g. Then, put 100g of hot water into the bowl with the 10g noodles. Then, time one minute. Then, put out the water and measure the water weight oh the noodles. Then, write down the results.	2
9. What are the results of the test?	https://drive.google.com/open?id=1Ohu6Mz_ZMLQWEwvl_QNKRvzG1FHGRyx	3
10. What is the conclusion of the test?	The weight of the fried egg noodles after soaking the hot water is heavier than other two noodles.	3
		26

YouTube HK

搜尋

- 首頁
- Shorts
- 訂閱內容
- 媒體庫
- 觀看記錄
- 你的影片
- 稍後觀看
- 顯示更多

訂閱內容

- GadgetGang HK
- 蔡瀾花花世界 Chua...
- DavidLeeEd/Tech
- Gavinchi 趙氏讀...

Curriculum

Assessment

在家科學小實驗 Stay Home Science Experiments

HKU Faculty of Education

17 部影片 觀看次數：2,216次 上次更新日期：2020...

全部播放 隨機播放

[在家科學小實驗]
(Please scroll down for English version)

為支援學生「停課不停學」，本學院的院校夥伴計劃辦事處及學生教師製作了一系列的在家

- 3:41
- 3:28
- 1:26
- 1:07
- 3:34
-

[在家科學小實驗]

為支援學生「停課不停學」，本學院的院校夥伴計劃辦事處及學生教師製作了一系列的在家科學小實驗，讓小學生在停課期間也可在家利用簡單材料，進行安全和有趣的實驗。教材套亦會發放予教師，支援教學工作，不但可提升學生學習的動力，亦可啟發學生在家學習。請登入 <https://web.edu.hku.hk/community/school-university-partnerships/others>，下載相關工作紙/使用手冊。

「在家小實驗培育子女科學探究精神」

明報 Happypama 版 (四月中出版)

Teacher related sites

Teacher Main Page

Learning and Teaching Resources

- Resources Depository
- EDB One-stop Portal for Learning and Teaching Resources
- STAR
- Online Question Bank
- EDB Educational MultiMedia (EMM)
- English Campus
- Chinese Campus
- Hong Kong Reading City
- eRead Scheme
- VLE Scheme
- eREAP
- Go AI

Resources Depository

STAR

Online Question Bank

Special Education Needs

- Inclusion Pavilion



全部資源 教育局資源 教城資源 社群資源

在家科學小實驗

搜

教學資源

教育局資源

教城資源

社群資源

0

A A

Curriculum

Assessment

相關搜尋: [在家科學小實驗](#), [physics](#), [力學](#), [蘇展朗](#), [so chin long](#)

第 1 - 10 個, 共 10144 個。搜尋共費 0.32 秒。



在家科學小實驗 – 水資源

作者: 香港大學教育學院物理教育文憑 (中學) 梁沛芳、香港大學教育學院梁健儀; LEUNG Pui Fong, PGDE in Physics (Secondary), Faculty of Education, The University of Hong Kong; LEUNG Kin Yi, Faculty of Education, The University of Hong Kong

10/7/2020 -- 影片示範如何透過在家水循環的實驗, 加深學生對水資源的認識及善用的意識。

排序方式 以相關性

資源

[教城資源 \(7974\)](#)

[教育局資源 \(2170\)](#)

學習領域

[中國語文教育 \(207\)](#)

[中國語文 \(137\)](#)

在家科學小實驗 – 光線會轉彎

0



作者：香港大學教育學院物理教育文憑梁偉康、香港大學教育學院梁健儀；
Leung Wai Hong, Willis, PGDE in Physics, Faculty of Education, The University of Hong Kong; LEUNG Kin Yi, Faculty of Education, The University of Hong Kong

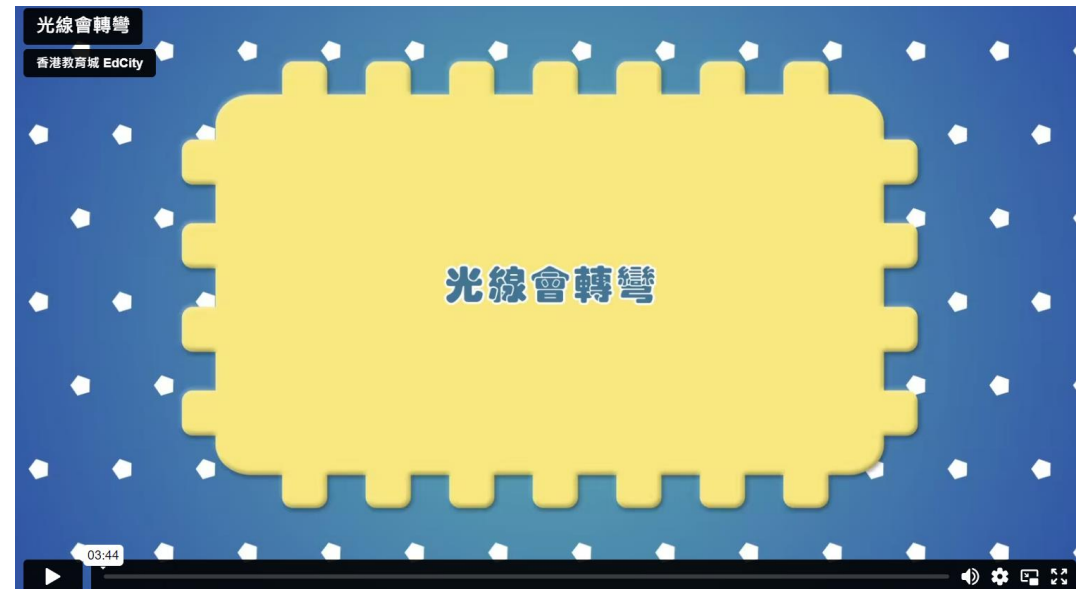
出版日期：10/07/2020

影片示範如何透過自製燈箱去探究自然現象：光的折射。

資源下載

全部下載

1.  香港大學教育學院網頁
2.  在家科學小實驗 – 光線會轉彎.docx
3.  在家科學小實驗 – 光線會轉彎
4.  在家科學小實驗 – 光線會轉彎.pdf



Curriculum

Assessment



共融資料館 > 專題資源 > 智力障礙 > 學科教材

支援有特殊學習需要學童持續學習（智齡三歲至六歲） 活動教材

作者：香港大學教育學院、香港紅十字會瑪嘉烈戴麟趾學校

最後更新：14/05/2021



為支援智齡三歲至六歲和有特殊學習需要的同學持續學習，香港大學教育學院準老師特意製作了五套容易使用，並以活動為主的教材。教材包括雙語影片和教學材料，可供家長及老師使用。

此活動教材為老師及家長提供多元化的學習教材。透過活動，同學可多方面提升個人能力，包括視覺、聽覺、肌肉運動、語言、音樂等。建議先觀看相關的簡短活動影片以了解遊戲目的和方法，並因應學習環境作出調節，有需要時亦可下載教材使用。

要設計一節活動課堂，所需的準備比傳統教學更多、難度亦更大。但對比傳統教學，活動教學可讓學生充分投

資源下載




-  動物在哪兒
-  轟炸機
-  製作餐單
-  學校守則你要知
-  以偏概全

Curriculum

Assessment

電子學習資源

OxfordSciXR App  教師  學生

-  利用**互動立體模型**解釋抽象概念
-  提供**虛擬與實境**混合學習體驗
-  **虛擬實驗室**及**互動聲效**提供沉浸式的學習體驗



iOS



Android

NEW



Instruction



PhET (Interactive Simulations)



Simulation

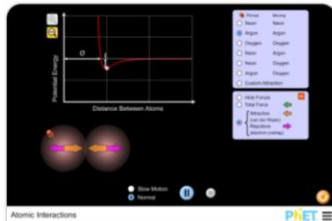
Browse F

SUBJECT

× 44 Results

- Physics
 - Motion
 - Sound & Waves
 - Work, Energy & Power
 - Heat & Thermo
 - Quantum Phenomena
 - Light & Radiation
 - Electricity, Magnets & Circuits

Physics × HTML5 ×

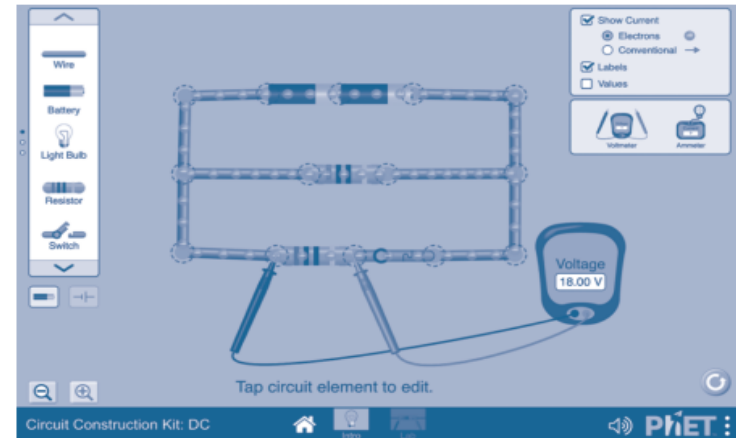


PhET simulation worksheet

Unit 8 Topic: Series and parallel circuits (p. 145)

This activity uses PhET simulation **Circuit Construction Kit: DC**.

https://digital.oupchina.com.hk/junsci/video/jsci_phet_u8dccircuit_e.html



Simulation by PhET Interactive Simulations, University of Colorado Boulder, licensed under CC-BY-4.0 (<https://phet.colorado.edu>).



Instruction

Labster (Virtual Lab - Gamified Learning Approach)



Instruction

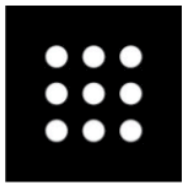
Labster

New Opportunities

AI Tools



ChatGPT



Perplexity



Curipod



Education Copilot



Yippity



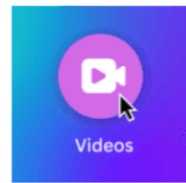
Quillbot



PowerPoint Spkr. Coach



Grammarly



Canva Bkgrnd. Remover



YouTube Summary



SlidesAI.io



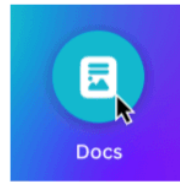
Adobe Bkgrnd. Remove



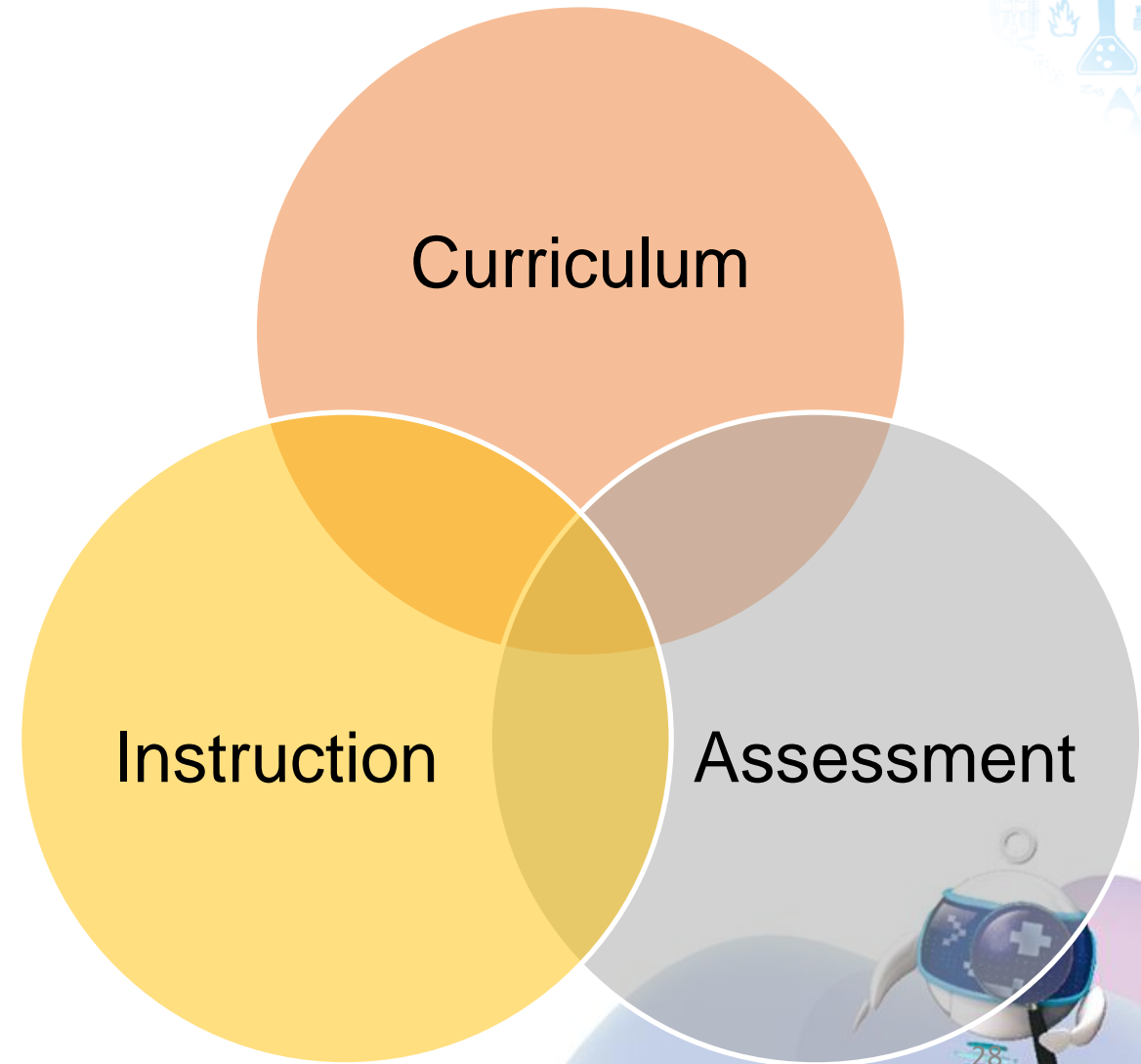
Speechify



DALL-E



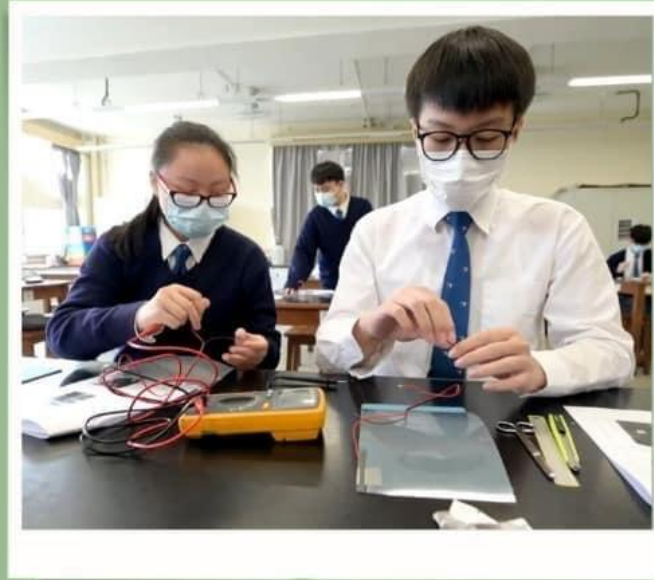
Canva Magic Write



Don't Ban ChatGPT in Schools. Teach With It. (12 Jan 23)

The New York Times





大力推動 STEAM 教育

更多創科學習元素

高小推行增潤編程教育
初中加入人工智能

加強統籌規劃

統籌人員規劃課堂內外的
STEAM教育和舉辦活動

提升教師培訓

教師參與創新科技基本專業培訓

2022年施政報告



施政報告 (2022) STEAM 教育

117. 我們會在中小學以普及化、趣味化、多元化的方式，大力推動 STEAM 教育，為學生打好基礎，配合香港未來發展創科的大方向。措施包括：

1. **普及學習** — 在課程中加入更多創科學習元素，目標是在2024/25學年前，至少四分之三公帑資助學校於高小推行強化編程教育，以及在初中課程加入創科元素，例如人工智能；
2. **加強領導和統籌** — 本學年起所有公帑資助中小學須委派統籌人員，整體規劃課堂內外的 STEAM 教育；下學年起，每年舉辦或安排學生參與具質素的 STEAM 活動；及
3. **提升專業培訓** — 在兩個學年內，至少四分之三公帑資助中小學需安排教師參與 STEAM 的專業培訓。



科學教育：新挑戰與新機遇

Science Education:

New Challenges and **New Opportunities**



Science Education: **New Challenges** and **New Opportunities**

Ride on **New Opportunities**

- Cater for diverse learning needs
(e.g., personalized learning)
- Promote learning equity
(e.g., resources accessibility)
- Enrich 21st-century skills and growth mindsets



Reference

Davidson, S. G., Jaber, L. Z., & Southerland, S. A. (2020). Emotions in the doing of science: Exploring epistemic affect in elementary teachers' science research experiences. *Science Education*, 104(6), 1008-1040.

OECD (2019). PISA 2018 assessment and analytical framework. In OECD, *PISA 2018 science framework* (pp. 97–117). OECD Publishing. <https://doi.org/10.1787/f30da688-en>

