



KEMENTERIAN PENDIDIKAN MALAYSIA

# CATCH-UP PLAN: Simulasi amali (*Virtual lab*)



# Satu perkongsian daripada **Pn. Wong Choy Wan**

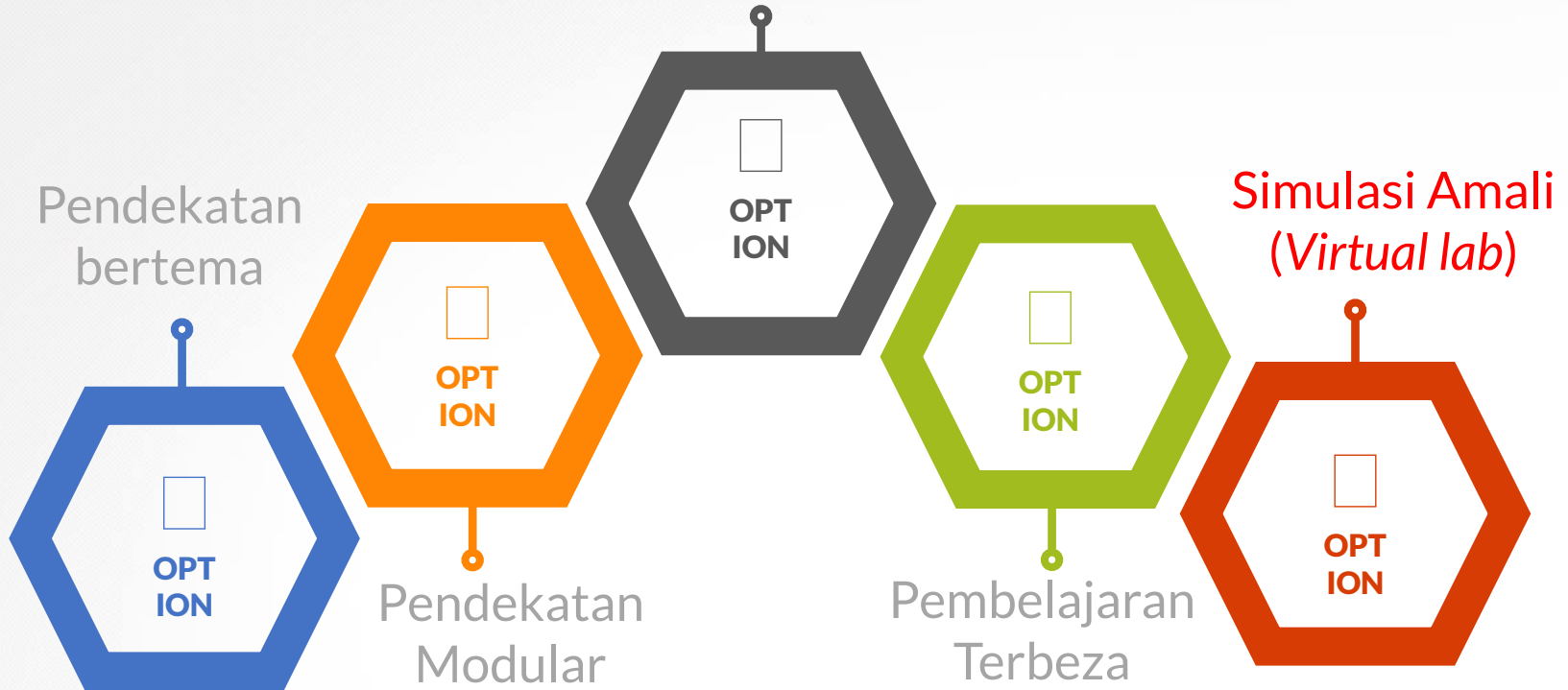


Guru Cemerlang Kimia,  
SMK Buntong, Ipoh, Perak.



# Kaedah PdP/ PdPR *Catch-Up Plan*

Pembelajaran Berasaskan Projek



Daripada seorang guru.....

4

Masa singkat,  
eksperimen yang  
perlu diganti  
banyak.  
Apa yang boleh  
saya lakukan?

Apakah cara yang  
berkesan untuk  
mendedahkan  
murid kepada  
kemahiran amali?



Bagaimana saya  
boleh  
melaksanakan  
eksperimen dan  
aktiviti yang  
ditetapkan?



Penyelesaian..... *Catch-Up Plan*

# Simulasi amali (Virtual lab)



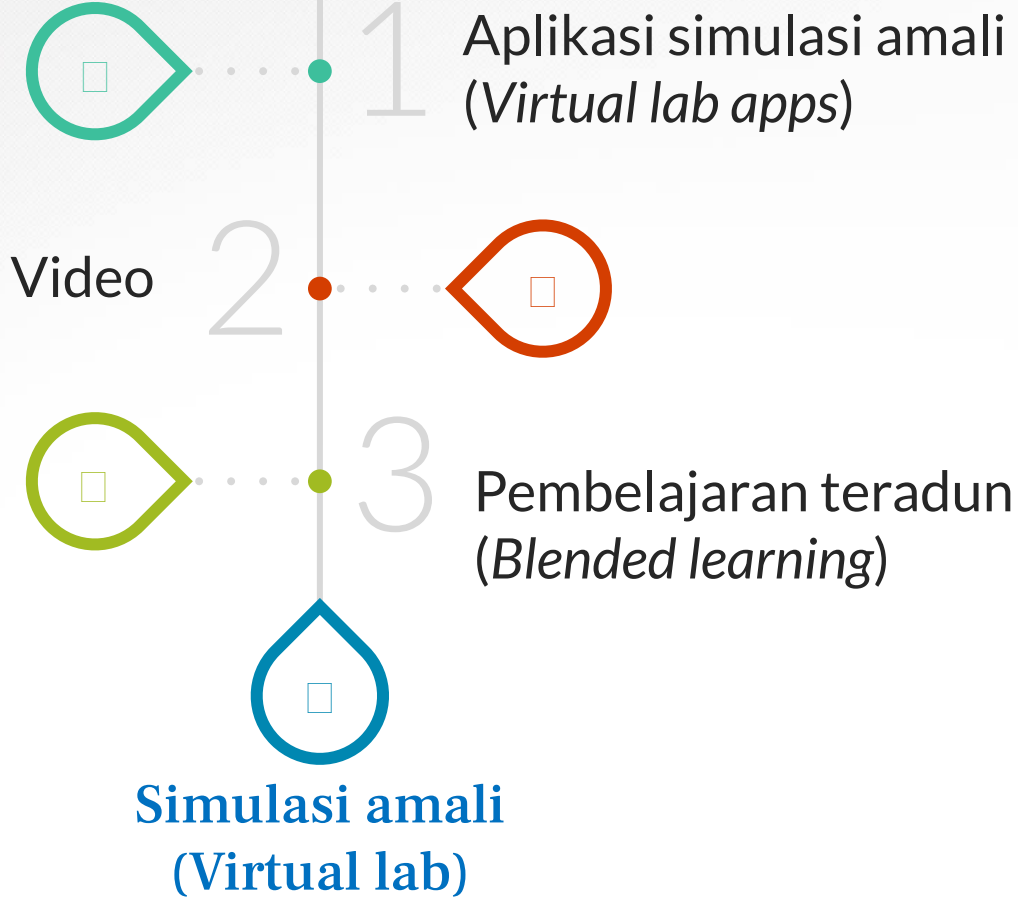



# Apakah itu **simulasi**?

- ✓ Aktiviti yang dijalankan **menyerupai yang sebenarnya**.
- ✓ Contoh simulasi yang utama:
  - **main peranan**
  - **permainan**
  - **penggunaan model**

**Bagaimana kaitkan simulasi dan amali ?**



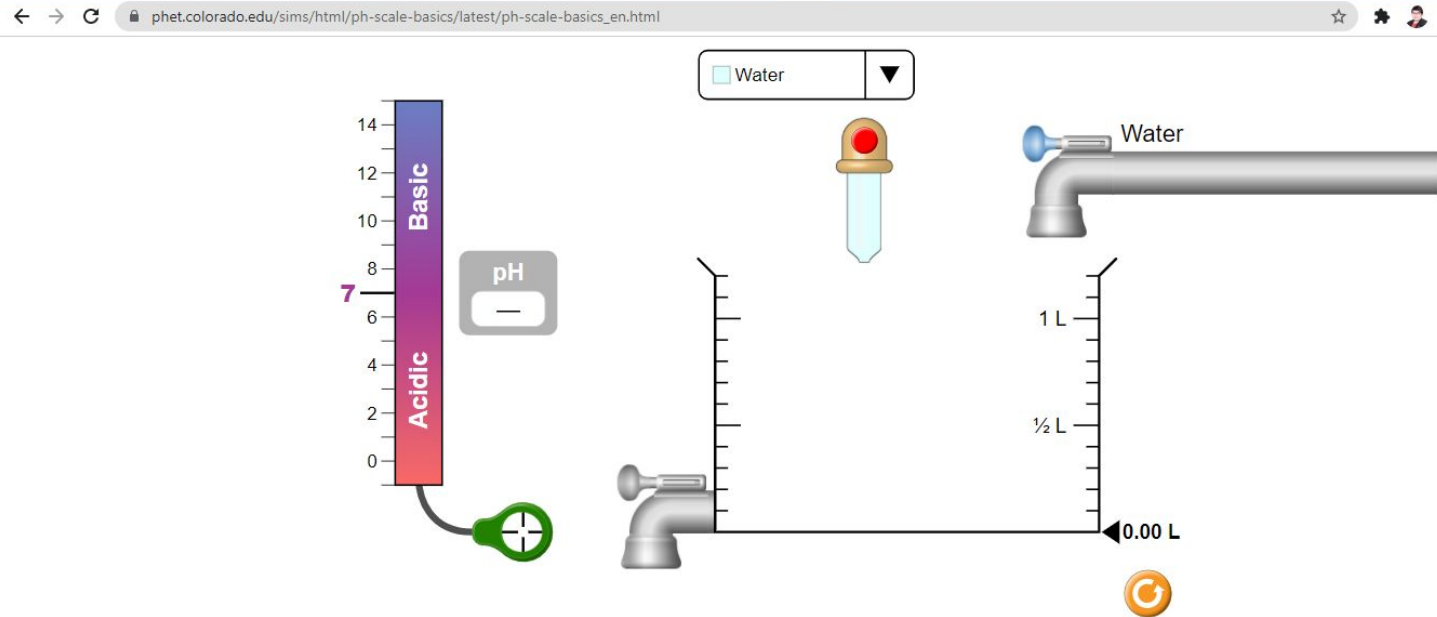




1.  
Aplikasi simulasi  
amali  
(*Virtual lab apps*)

# Contoh 1: Asid dan bes (Sains T2/ Kimia T4)

[https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics\\_en.html](https://phet.colorado.edu/sims/html/ph-scale-basics/latest/ph-scale-basics_en.html)



pH Scale: Basics

PhET

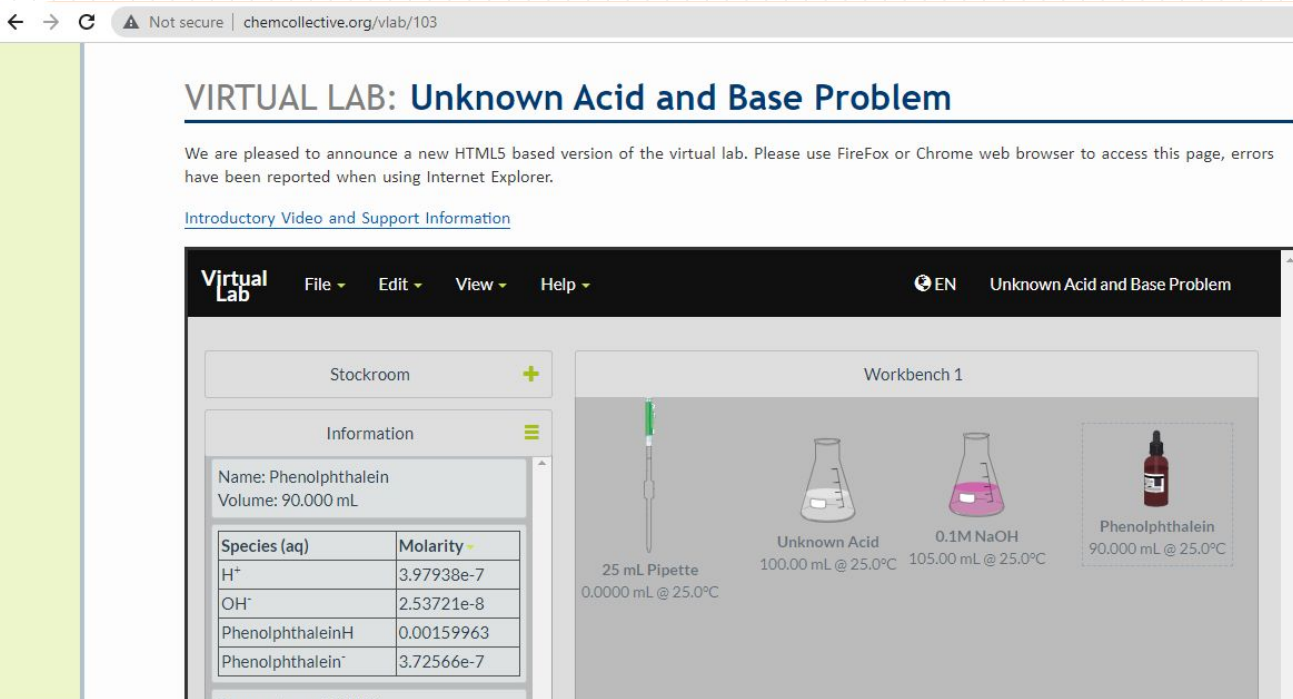
# Contoh 2: Asid dan bes (Sains T2/ Kimia T4)

[https://phet.colorado.edu/sims/html/ph-scale/latest/ph-scale\\_en.html](https://phet.colorado.edu/sims/html/ph-scale/latest/ph-scale_en.html)

The screenshot shows the PhET pH Scale simulation interface. At the top, a browser address bar displays the URL: [phet.colorado.edu/sims/html/ph-scale/latest/ph-scale\\_en.html](https://phet.colorado.edu/sims/html/ph-scale/latest/ph-scale_en.html). The main simulation area features a vertical pH scale on the left, ranging from 0 to 14. The scale is color-coded: red for acidic (0-7), purple for neutral (7), and blue for basic (7-14). A green plus sign icon is positioned below the scale. To the right of the scale is a digital pH meter showing a reading of 7. In the center, a beaker is partially filled with light blue liquid, labeled "Neutral". Above the beaker is a red-tipped dropper. To the right of the beaker is a faucet labeled "Water" with a blue handle. A volume scale on the right indicates 0.50 L of liquid in the beaker. A dropdown menu at the top center shows "Water" with a downward arrow. At the bottom of the simulation, there is a black toolbar with the text "pH Scale" on the left, navigation icons for "Home", "Macro", "Micro", and "My Solution" in the center, and the PhET logo on the right. The background of the slide is decorated with various blue hand-drawn icons representing science and mathematics, such as a calculator, a microscope, a globe, a lightbulb, and chemical structures.

# Contoh 3: Asid dan bes (Sains T2/ Kimia T4)

<http://chemcollective.org/vlab/103>



← → ↻ ⚠ Not secure | chemcollective.org/vlab/103

## VIRTUAL LAB: Unknown Acid and Base Problem

We are pleased to announce a new HTML5 based version of the virtual lab. Please use FireFox or Chrome web browser to access this page, errors have been reported when using Internet Explorer.

[Introductory Video and Support Information](#)

**Virtual Lab** File Edit View Help EN Unknown Acid and Base Problem

Stockroom +

Information ≡

Name: Phenolphthalein  
Volume: 90.000 mL

Species (aq)	Molarity
H <sup>+</sup>	3.97938e-7
OH <sup>-</sup>	2.53721e-8
PhenolphthaleinH	0.00159963
Phenolphthalein <sup>-</sup>	3.72566e-7

Workbench 1

25 mL Pipette  
0.0000 mL @ 25.0°C

Unknown Acid  
100.00 mL @ 25.0°C

0.1M NaOH  
105.00 mL @ 25.0°C

Phenolphthalein  
90.000 mL @ 25.0°C

# Contoh 4: Pek panas dan pek sejuk (Sains T3/ Kimia T5)

<http://chemcollective.org/activities/autograded/118>

You are here: [Home](#) > [Thermochemistry](#) / [Autograded Virtual Labs](#) > [Hot/Cold Pack Problem - Part 2](#)

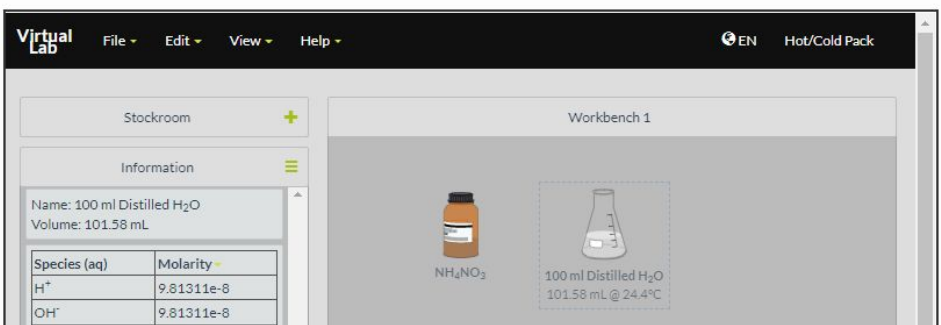
Page loaded on Sunday 7. Nov 2021 18:19:38

## Virtual Lab Part 2: Design a Hot/Cold Pack

**[Cold Pack].** Based on your results from part 1, design a cold pack using  $\text{NH}_4\text{NO}_3(\text{s})$ . It should have a total mass of 100 g (salt plus water) and be able to achieve a temperature of  $10.0^\circ\text{C}$ . Assume a specific heat for the solution of  $4.184 \text{ J/g}^\circ\text{K}$  (same as for water) and an initial temperature of  $25^\circ\text{C}$  for the water in the cold pack.

You can check your calculations in the virtual lab below. To create a calorimeter in the virtual lab, right click on any piece of glassware and choose "Thermal Properties..." In the Thermal Properties dialogue box, check "insulate". Assume that the calorimeter container does not absorb any heat and that the specific heat for the solution is  $4.184 \text{ J/g}^\circ\text{K}$  (same as for water). You may also find the scale useful in your experiment.

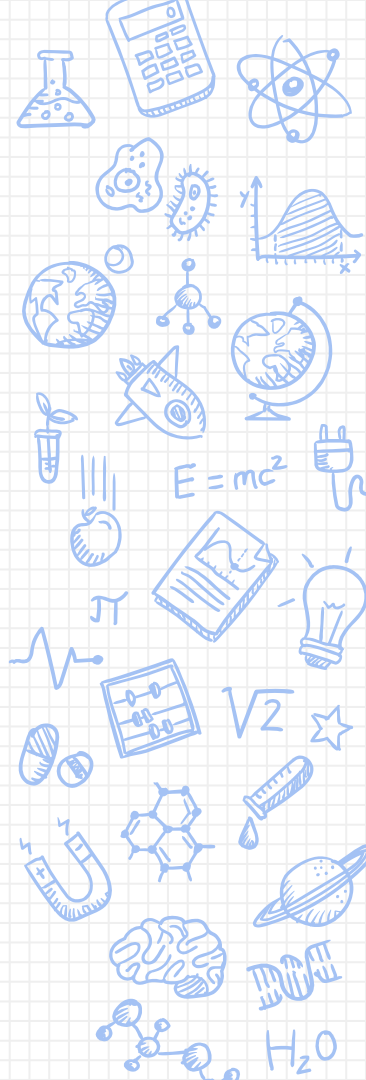
To ensure that the amount of solid added to the calorimeter is accurately recorded, the mass of salt should be weighed out by differences. Click on "Solid" button on the "Solution Information" window on the right. Highlight the jar of salt to see the mass of the solid. Transfer the required amount to the calorimeter and check the mass of the salt again.



The screenshot shows the Virtual Lab interface. On the left is the Stockroom with a plus sign. Below it is the Information panel for the selected item, showing Name: 100 ml Distilled H<sub>2</sub>O, Volume: 101.58 mL, and a table of species and molarities. On the right is the Workbench 1, which contains a bottle of NH<sub>4</sub>NO<sub>3</sub> and a beaker containing 100 ml Distilled H<sub>2</sub>O at 101.58 mL @ 24.4°C.

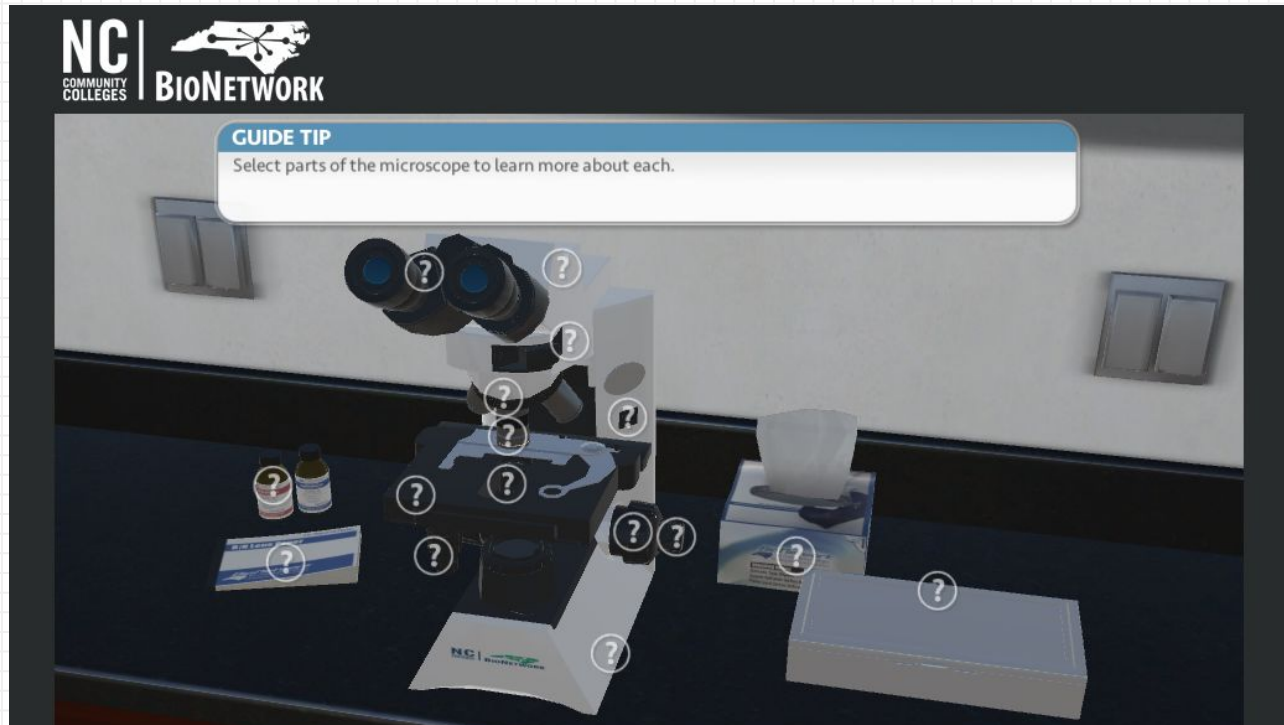
Species (aq)	Molarity
H <sup>+</sup>	9.81311e-8
OH <sup>-</sup>	9.81311e-8

Item	Mass / Volume / Temp
NH <sub>4</sub> NO <sub>3</sub>	
100 ml Distilled H <sub>2</sub> O	101.58 mL @ 24.4°C



# Contoh 5: Penggunaan mikroskop (Sains T1/ Biologi T4 & T6)

<https://www.ncbionetwork.org/iet/microscope/>

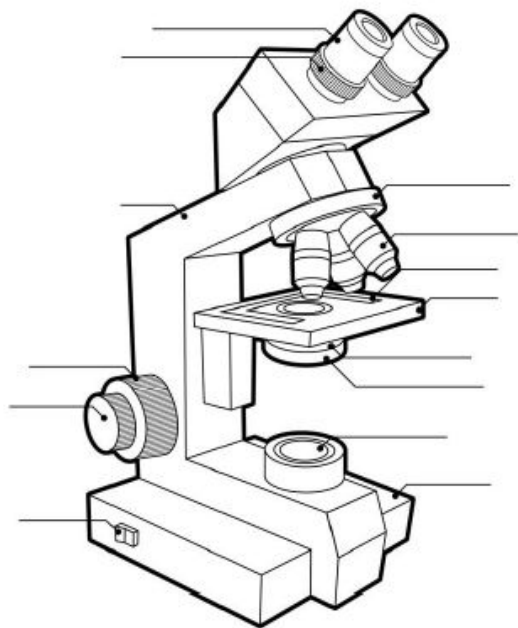




**Assessment 1: Identifying the parts of compound microscope**

1. Label the major parts of the compound microscope.

Arm	Condenser	Base	Stage
Ocular lens	Objective lens	Revolving nosepiece	Diaphragm
Switch	Slide holder	Light source	Diopter adjustment
Fine adjustment knob	Coarse adjustment knob		



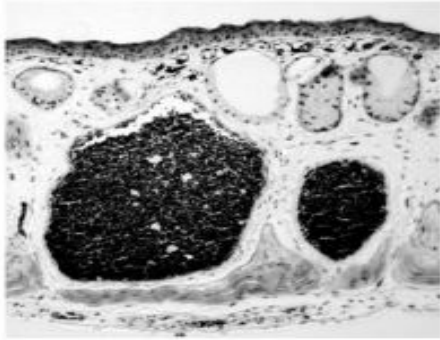
2. State the functions for the following parts of microscope:

- Condenser: .....
- Diaphragm: .....
- Fine adjustment knob: .....
- Coarse adjustment knob: .....

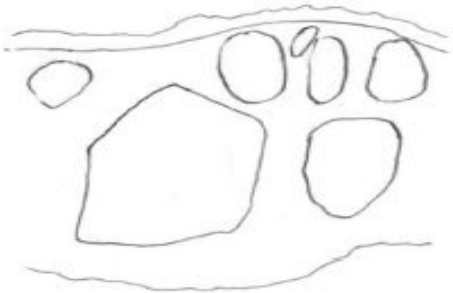
## Activity 1: Steps in drawing a biological illustration

1. The following diagrams show general steps in biological drawing.

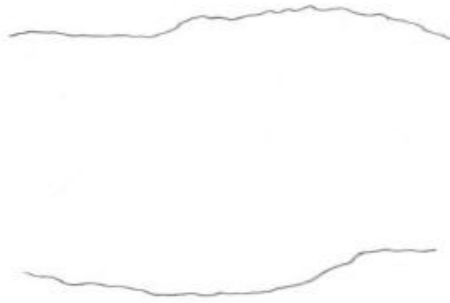
a. Select an area of slide and magnification that best suits to your learning outcomes.



c. Add the outlines of major structures and shapes found in the area observed.



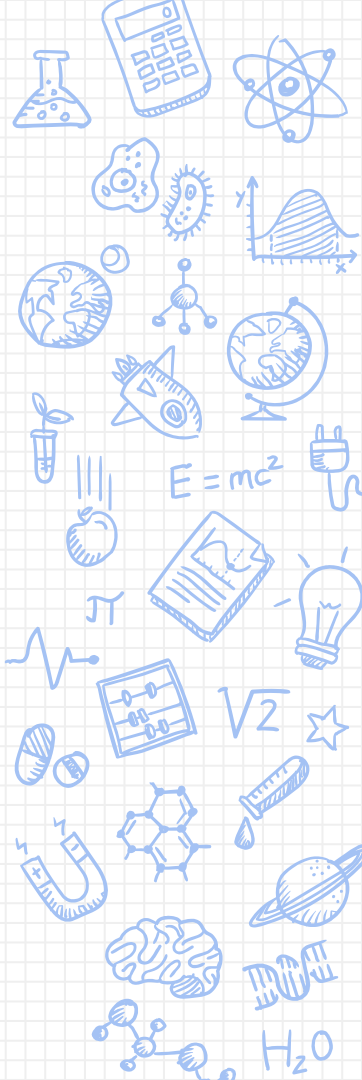
b. Draw an outline of the basic shape of the selected area.



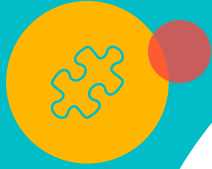
d. Draw the outlines to differentiate distinct regions within the major structure.



e. Finally, label the key structures correctly.



## 2. Video



## Contoh 6: Transpirasi (Sains T3)

Tema:

Penyenggaraan dan kesinambungan hidup

Standard Kandungan:

3.4 Pengangkutan dalam tumbuhan

Standard pembelajaran:

3.4.2 Menjalankan eksperimen untuk mengkaji faktor yang mempengaruhi kadar transpirasi.



Pengetahuan  
sedia ada:  
Murid  
mengetahui  
maksud  
transpirasi.



# Faktor yang mempengaruhi kadar transpirasi

Video Simulasi Amali (*Virtual lab*):

<https://www.youtube.com/watch?v=PJGeN5mZspw>



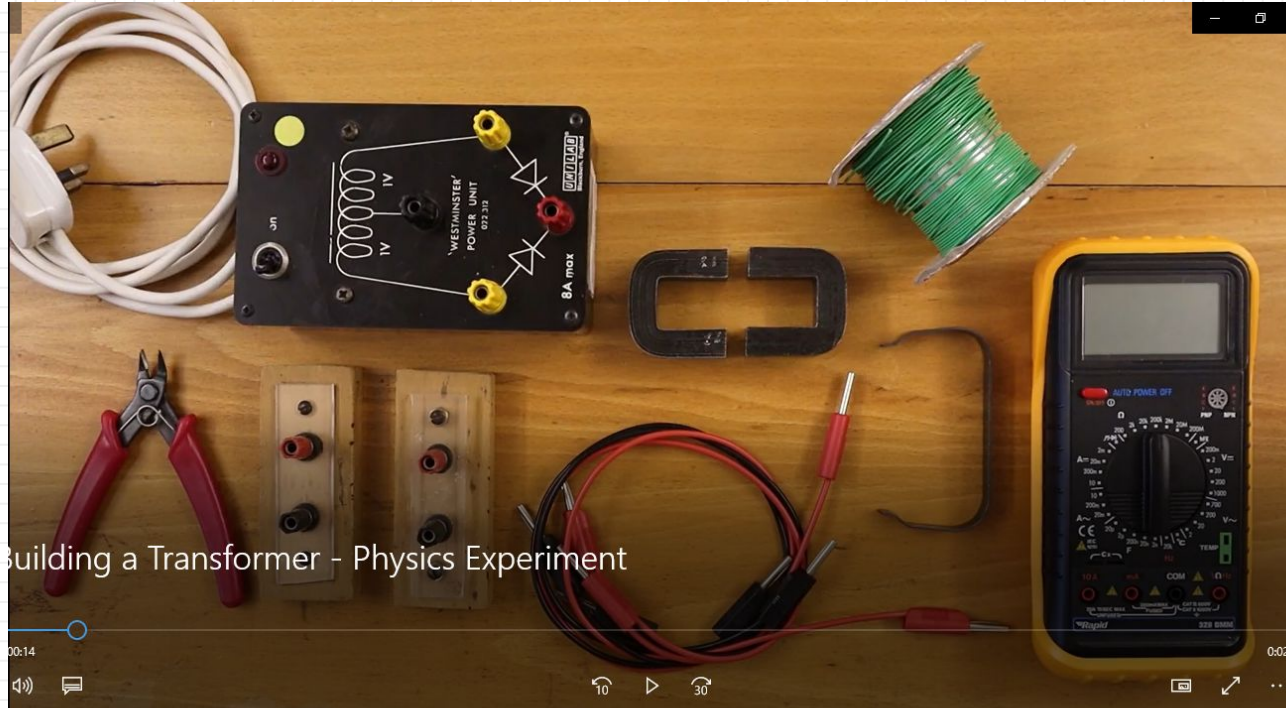
# Experiment on Transpiration



# Membina transformer

Video Simulasi Amali (*Virtual lab*):

<https://www.youtube.com/watch?v=cZsEF9odc3w>



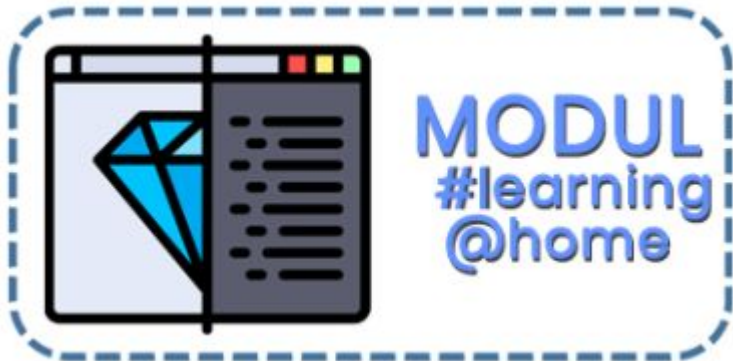



## Sumber video

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✓ Anjung ilmu guru Perak

<https://anjungilmuguruperak.blogspot.com/>





3.  
Pembelajaran  
Teradun  
(*Blended learning*)

- ✓ Simulasi amali secara dalam talian dan luar talian
- ✓ Melibatkan aktiviti hands-on dengan menggunakan bahan yang ada di rumah (Home lab)
- ✓ Murid melaksanakan tugas dengan menggunakan apps

## Contoh 8: Asid, bes dan garam (Kimia T4)

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Tema:

Interaksi antara jirim

Bidang pembelajaran:

6.0 Asid, bes dan garam

Standard Kandungan:

6.2 Nilai pH

Standard pembelajaran:

6.2.3 Mengeksperimen untuk mengkaji hubungan nilai pH dengan kepekatan ion hydrogen dan kepekatan ion hidroksida



# Gabungan Flipped-Classroom dan Simulasi Amali



## Pelibat

Memperoleh beberapa jenis bahan di rumah dan mengklasifikasikan kepada asid dan alkali

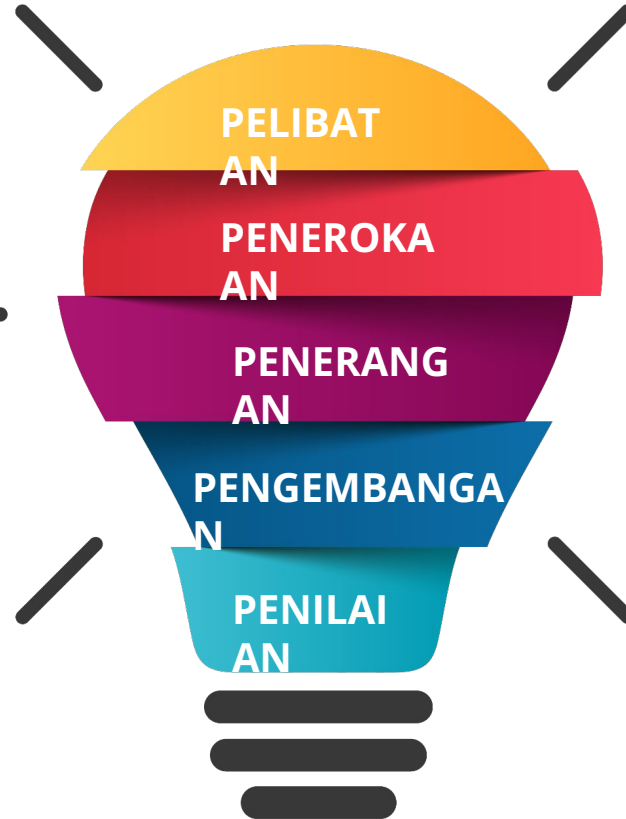


## Penerokaan

Menghasilkan penunjuk semula jadi untuk menguji bahan-bahan yang disediakan

## Penerangan

Menerangkan keputusan sesi penerokaan.



## Pengembangan

- **Simulasi amali:** Mengkaji hubungan nilai pH dengan kepekatan ion hydrogen dan ion hidroksida


[Pautan: [https://phet.colorado.edu/sims/html/ph-scale/latest/ph-scale\\_en.html](https://phet.colorado.edu/sims/html/ph-scale/latest/ph-scale_en.html)]

- Penghitungan nilai pH dengan menggunakan rumus


## Penilaian



PBD dengan menggunakan soalan objektif, soalan struktur atau soalan esei





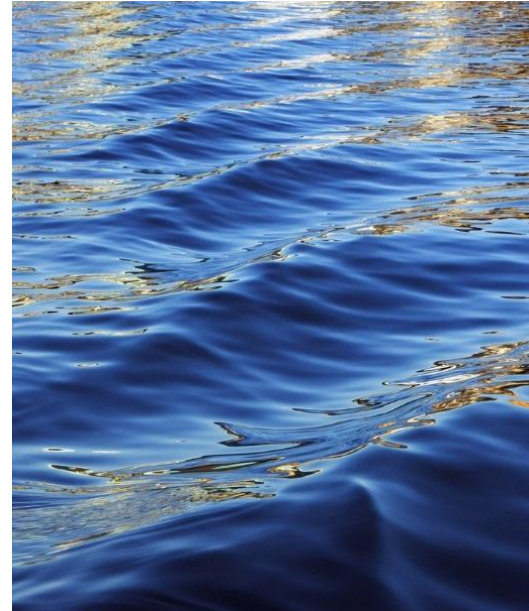
**Daripada simulasi  
amali ke amali di  
rumah**





# Aktiviti sains @rumah: Mengkaji fototropisme tumbuhan

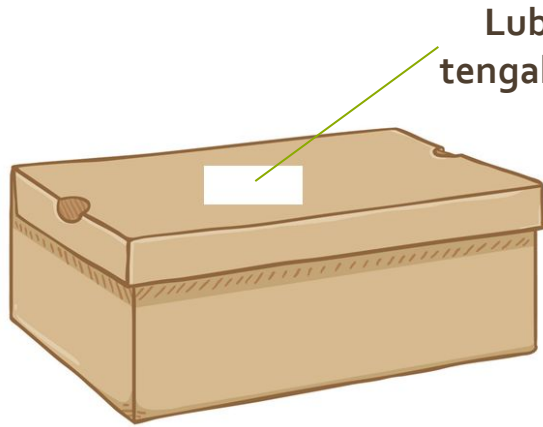
Dibimbing oleh:  
Pn.. Wong Choy Wan  
Pn. Choong Peit Chun  
SMK Buntong, Ipoh, Perak.



# Bahan yang diperlukan

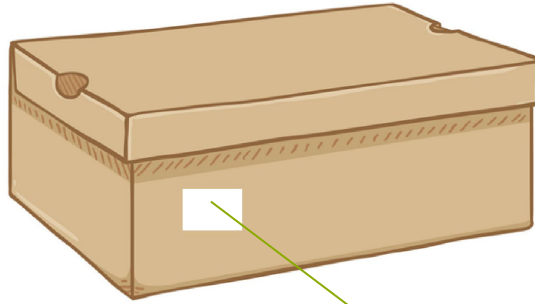
Bahan	Bilangan
Kotak	2
Tumbuhan kecil atau anak pokok	2
Gunting atau pisau kecil	1

# Persediaan



Set A

Lubang di  
tengah-tengah

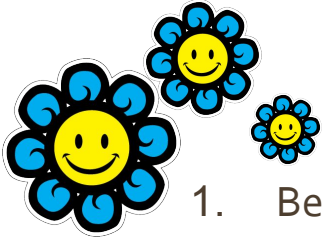


Set B

Lubang pada  
mana-mana  
bahagian  
kotak

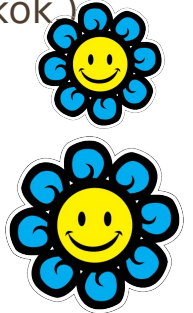
Jangan lupa mengambil gambar kotak anda. Anda perlu menggunakannya dalam persembahan anda.



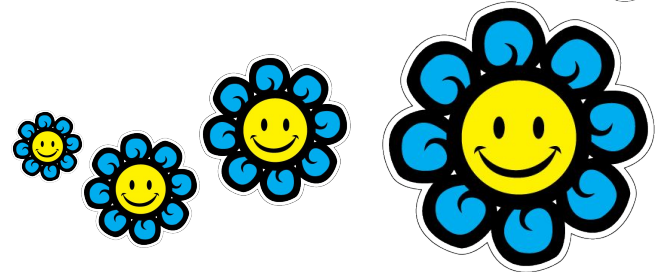


## Seterusnya

1. Bersedia dengan kotak, berlabel A dan B.
2. Letakkan sekeping plastik atau *aluminium foil* ke dalam kotak.
3. Letakkan anak pokok anda ke kepingan plastik atau aluminium foil. (Ini untuk mengelakkan dasar kotak basah ketika anda menyiram anak pokok.)
4. Lakukan perkara yang sama untuk Kotak A dan Kotak B.
5. Letakkan dua kotak dekat dengan tingkap.
6. Ambil gambar susunan ini dan label sebagai Hari 1.
7. Perhatikan perubahan pada anak pokok setiap hari, selama 1 minggu.



Jangan lupa mengambil gambar semasa anda membuat pemerhatian pada setiap hari.  
Anda memerlukan gambar ini untuk langkah seterusnya.



# Persembahan

Tunjukkan apa yang telah anda buat untuk kajian anda langkah demi langkah dengan gambar. Huraikan langkah anda dan tunjukkan apa yang anda tahu.

- Anda boleh menyampaikan kajian dan hasil anda dengan cara kreatif anda sendiri.
- Ia dapat dipersembahkan menggunakan video, poster, atau buku catatan sains menggunakan *google slide*.
- Anda boleh menggunakan aplikasi elektronik untuk menghasilkan seperti inshot, canva dll.
- Sekiranya anda ingin melukis, tiada masalah. Selepas melukis, ambil gambar dan hantarkan kepada cikgu.
- Semua persembahan harus dihantar ke **kumpulan telegram kami pada atau sebelum 9 Mac 2021, 12.00 tengah hari.**
- Sebarang persembahan lewat dari hari dan waktu yang dinyatakan tidak diambil kira sebagai PBD anda, Tahap Prestasi 5.



Perkara ini perlu ada dalam persembahan  
anda

Tajuk

Nama anda

Kelas anda

Nama guru:  
Pn. Wong Choy Wan

Bagaimana anda menjalankan  
kajian(Prosedur)

Pemerhatian anda untuk 1  
minggu(Pemerhatian)  
Di bahagian ini, anda boleh memasukkan  
gambar yang telah anda ambil.

Keputusan

# Maklumat yang boleh membantu anda

- Anda boleh mendapat lebih banyak maklumat dan memuat turun buku catatan interaktif Google Slides dari sini

<https://ditchthattextbook.com/google-slides-interactive-notebook-s-20-activities-to-fill-them/#t-1594864807013>



Selamat menjalankan  
kajian anda



## Sumber simulasi amali

<https://praxilabs.com/>

<http://chemcollective.org/>

<https://phet.colorado.edu/>



**“There are no secrets to success. It is the result of preparation, hard work, and learning from failure.”**

**~Colin Powell**