

**SCIENTIFIC SKILLS EXERCISE: VARIABLES**  
**LATIHAN KEMAHIRAN SAINTIFIK : PEMBOLEHUBAH**

- 1 Table 3 shows the result of the reaction between 3.0 g of zinc metal with 100cm<sup>3</sup> dilute hydrochloric acid.  
 Jadual 3 menunjukkan keputusan bagi tindakbalas antara 3.0 g logam zink dengan 100cm<sup>3</sup> asid hidroklorik cair.

|                                                                 |   |    |    |    |    |    |    |
|-----------------------------------------------------------------|---|----|----|----|----|----|----|
| Time /minit<br>Masa/minit                                       | 0 | 1  | 2  | 3  | 4  | 5  | 6  |
| Volume of gas/ cm <sup>3</sup><br>Isipadu gas / cm <sup>3</sup> | 0 | 27 | 46 | 57 | 64 | 67 | 67 |

 TABLE 3  
 JADUAL 3

| Variable<br>Pembolehubah | Answer<br>Jawapan |
|--------------------------|-------------------|
| Manipulated              |                   |
| Responding               |                   |

- 2 Diagram 1 shows an experiment to study the reactivity of metals when react with oxygen.  
 Rajah 1 menunjukkan satu eksperimen untuk mengkaji kereaktifan logam bila bertindak balas dengan oksigen

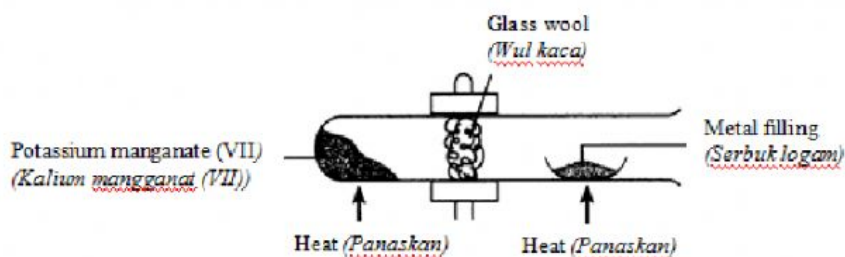


DIAGRAM 1

Three types of metals X, Y and Z are used and the results are shown in the Table 1.  
 Tiga jenis logam iaitu X, Y dan Z telah digunakan dan keputusan pemerhatian ditunjukkan dalam Jadual 1.

| Variable<br>Pembolehubah | Answer<br>Jawapan |
|--------------------------|-------------------|
| Constant                 |                   |
| Manipulated              |                   |
| Responding               |                   |

3. Diagram 4.1 and Diagram 4.2 show an experiment to study the malleability of two types of substances when they were hammered for a few times.  
Rajah 6.1 dan gambarajah 6.2 menunjukkan eksperimen untuk mengkaji kebolehtempaan dua jenis bahan apabila diketuk dengan penukul beberapa kali



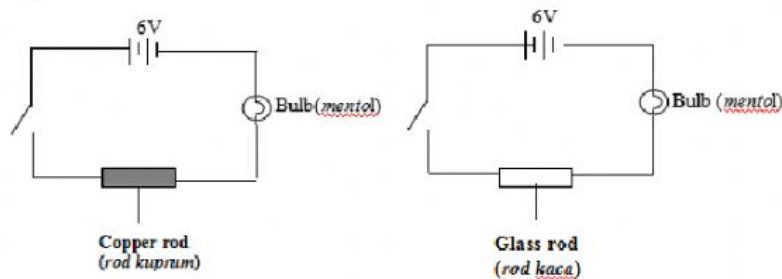
Diagram 4.1  
Rajah 4.1



Diagram 4.2  
Rajah 4.2

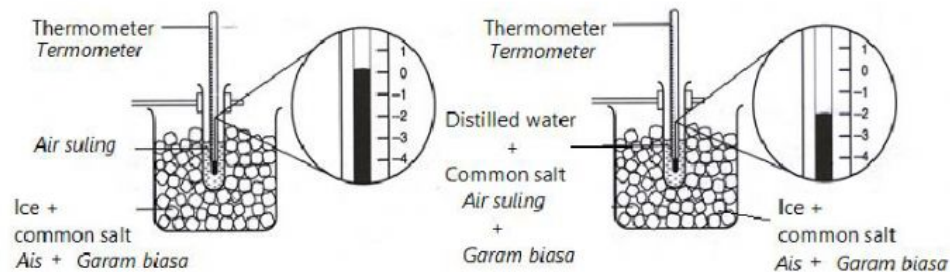
| Variable<br>Pembolehubah | Answer<br>Jawapan |
|--------------------------|-------------------|
| Constant                 |                   |
| Manipulated              |                   |
| Responding               |                   |

4. Diagram 5 shows an experiment to study the electrical conductivity for two types of material.  
Rajah 5 menunjukkan satu eksperimen untuk mengkaji kekonduksian elektrik bagi dua jenis bahan.



| Variable<br>Pembolehubah | Answer<br>Jawapan |
|--------------------------|-------------------|
| Constant                 |                   |
| Manipulated              |                   |
| Responding               |                   |

- 5 Diagram 6.1 and 6.2 show an experiment to study the effect of impurities on the freezing point of distilled water.  
Rajah 6.1 dan 6.2 menunjukkan eksperimen untuk mengkaji kesan bendasing keatas takat beku air suling.



| Variable<br>Pembolehubah | Answer<br>Jawapan |
|--------------------------|-------------------|
| Constant                 |                   |
| Manipulated              |                   |
| Responding               |                   |

- 6 Diagram 2(a) and 2(b) show an experiment to compare the reactivity of metal L and metal M with dilute hydrochloric acid.  
Rajah 2(a) dan 2(b) menunjukkan satu eksperimen untuk membandingkan kereaktifan logam L dan logam M dengan asid hidroklorik cair

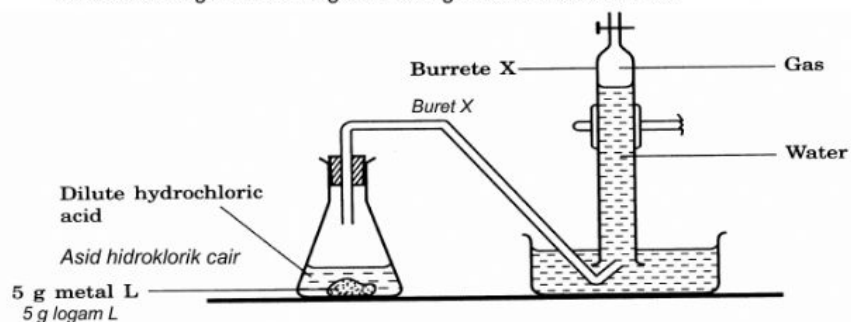


Figure 2(a)

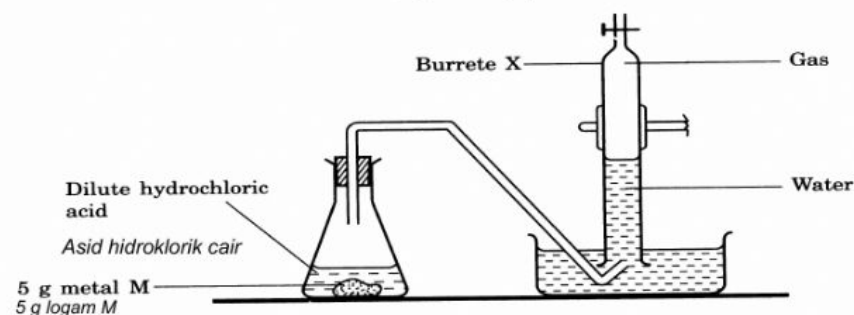


Figure 2(b)

(a) Write down **one** observation for the above experiment.

| Variable<br><i>Pembolehubah</i> | Answer<br><i>Jawapan</i> |
|---------------------------------|--------------------------|
| Constant                        |                          |
| Manipulated                     |                          |
| Responding                      |                          |

- 7 Diagram 5.1 and Diagram 5.2 shows an experiment to study the reactivity of metals with dilute hydrochloric acid  
*Rajah 5.1 dan Rajah 5.2 menunjukkan satu eksperimen untuk mengkaji kereaktifan logam dengan asid hidroklorik cair*

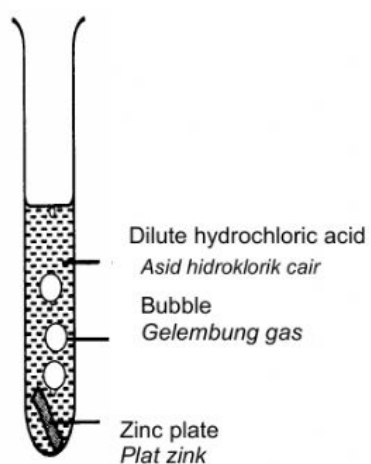


Diagram 5.1  
*Rajah 5.1*

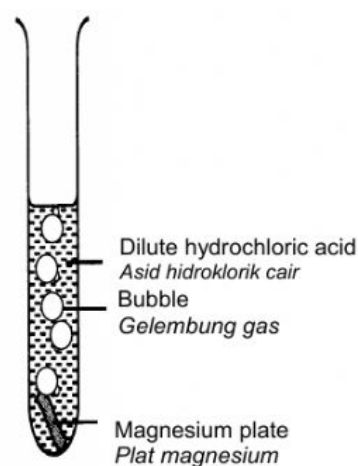


Diagram 5.2  
*Rajah 5.2*

| Variable<br><i>Pembolehubah</i> | Answer<br><i>Jawapan</i> |
|---------------------------------|--------------------------|
| Constant                        |                          |
| Manipulated                     |                          |
| Responding                      |                          |

- 8 Diagram 6.1 and Diagram 6.2 show an experiment to study the electrical conductivity of lead (II) bromide.  
 Rajah 6.1 dan Rajah 6.2 menunjukkan satu eksperimen untuk mengkaji Kekonduksian elektrik plumbum (II) bromida.

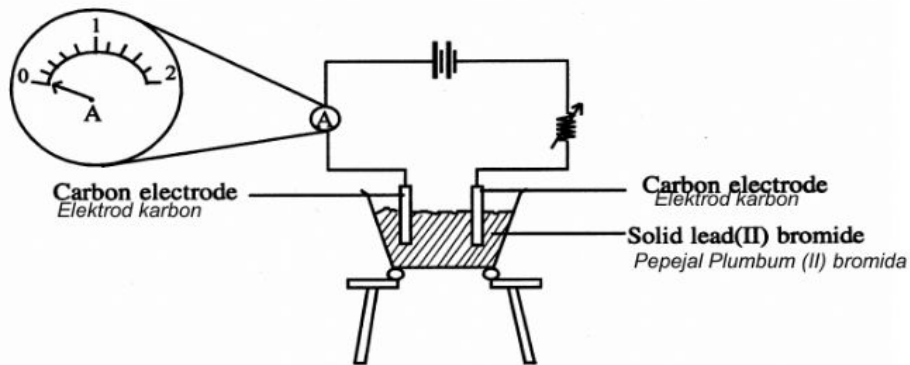


Diagram 6.1  
Rajah 6.1

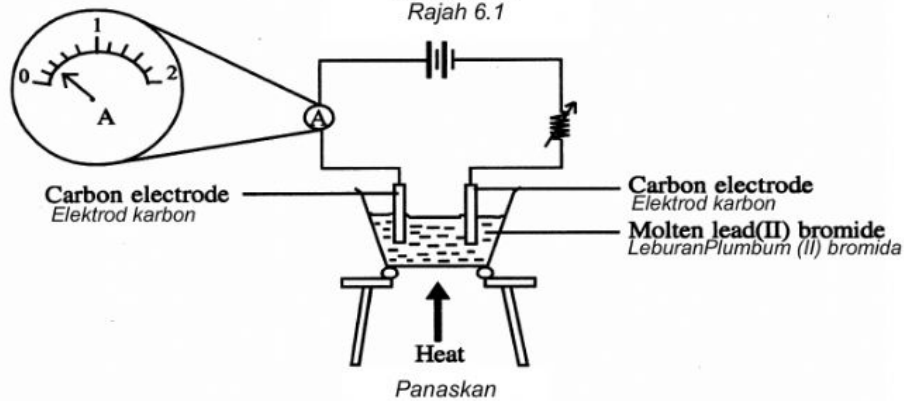
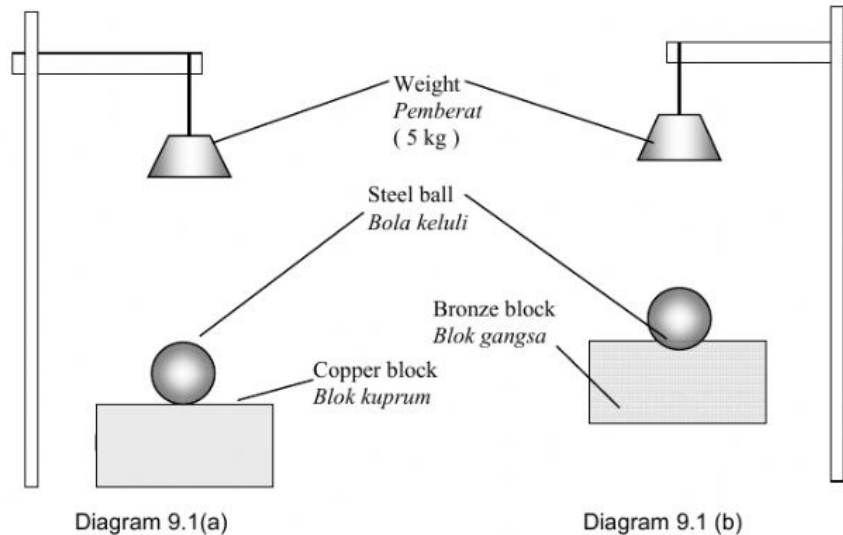


Diagram 6.2  
Rajah 6.2

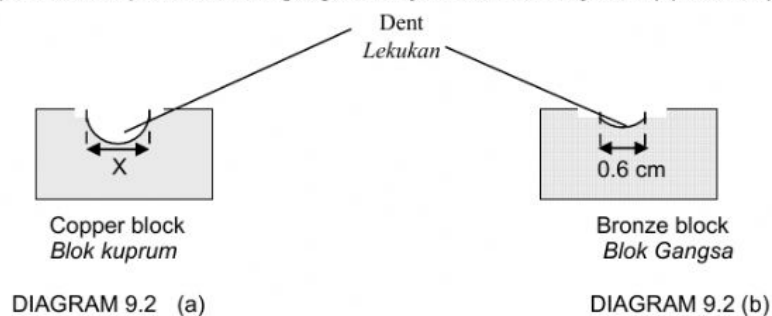
| Variable<br>Pembolehubah | Answer<br>Jawapan |
|--------------------------|-------------------|
| Constant                 |                   |
| Manipulated              |                   |
| Responding               |                   |

- 9 Diagrams 9.1(a) and 9.1(b) show an experiment to study the hardness of copper block and bronze block when the weights are dropped onto a steel ball.
- Rajah 9.1(a) dan 9.1(b) menunjukkan satu eksperimen untuk mengkaji kekerasan blok kuprum dan blok gangsa apabila pemberat dijatuhkan ke atas bola keluli.



The effects on the copper block and bronze block are shown in Diagram 9.2(a) and 9.2(b).

Kesan pada blok kuprum dan blok gangsa ditunjukkan dalam Rajah 9.2(a) dan 9.2(b).



| Variable<br><i>Pembolehubah</i> | Answer<br><i>Jawapan</i> |
|---------------------------------|--------------------------|
| Constant                        |                          |
| Manipulated                     |                          |
| Responding                      |                          |

- 10 Diagram 2(i) and Diagram 2(ii) shows the image formed by a convex lens when the object is placed at different distance.

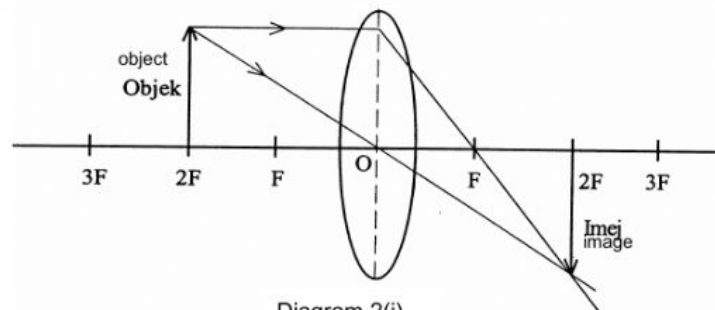


Diagram 2(i)  
Rajah 2(i)

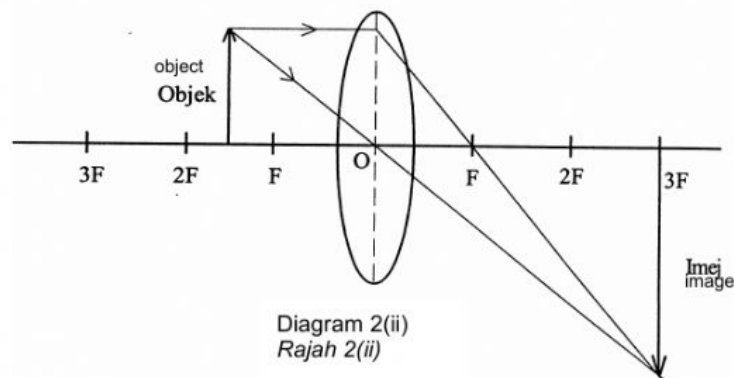


Diagram 2(ii)  
Rajah 2(ii)

| Variable<br><i>Pembolehubah</i> | Answer<br><i>Jawapan</i> |
|---------------------------------|--------------------------|
| Constant                        |                          |
| Manipulated                     |                          |
| Responding                      |                          |

11. Diagram 5.1 and Diagram 5.2 show an experiment to study the characteristics of an image formed by a pin hole camera.  
Rajah 5.1 dan Rajah 5.2 menunjukkan satu eksperimen untuk mengkaji ciri imej yang dibentuk oleh satu kamera lubang jarum.

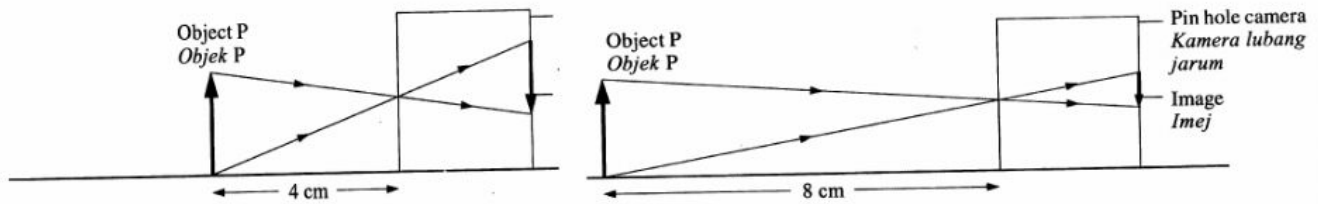


Diagram 5.1

Diagram

| Variable<br><i>Pembolehubah</i> | Answer<br><i>Jawapan</i> |
|---------------------------------|--------------------------|
| Manipulated                     |                          |
| Responding                      |                          |

- 12 Diagram 1 shows an experiment to study the relationship between the thickness of convex lens with the focal length of the convex lens.  
*Rajah 1 menunjukkan satu eksperimen untuk mengkaji hubungan antara ketebalan kanta cembung dengan jarak fokus kanta cembung.*

| Variable<br><i>Pembolehubah</i> | Answer<br><i>Jawapan</i> |
|---------------------------------|--------------------------|
| Constant                        |                          |
| Manipulated                     |                          |
| Responding                      |                          |