HKDSE Biology SBA Annual Teachers' Conference 2024-2025

12 October 2024

Mr Chan Ka Loi, Roy

Manager – Assessment Development

香港考試及評核局
Hong Kong Examinations and Assessment Authority

Programme Rundown

Time	Event	Speakers
9:00 – 9:10	Registration	---
9:10 – 9:45	- Logistics for 2025 and 2026 SBA - Review on 2024 SBA	Mr Chan Ka Loi, Roy
9:45 – 10:30	Revision of SBA B1	Dr. Chan Kam Ho, Kennedy
10:30 – 10:45	Break	---
10:45 – 12:00	Implementation of SBA B2 and Teachers' Sharing	Mr. Ho Tik Shun, Dickson Ms Leung Yue Shan, Jennifer Mr. To Ching Yuet, Andrew
12:00 – 12:15	Further support to teachers in the future	Mr Chan Ka Loi, Roy Dr. Chan Kam Ho, Kennedy
12:15 – 12:30	Meeting with DCs	District Coordinators

2025 Biology SBA schedule

Month/Year	Task
Sep – Dec 2024	S6 SBA activities to be conducted by schools

15 Jan – 10 Feb 2025	• SBA marks of S6 students
	  • 2 assessments on Ability Area A
	  • 2 assessments on Ability Area B
	• Marked reports of six students chosen by the HKEAA
	• List of Experiments performed in S5 &S6
	• Lab Manual/Worksheet (used for assessment)

Submission of students' work

- Before submitting the SBA marks online, **students should be informed of the marks awarded and that these marks are also subject to moderation by the HKEAA**
- Advise students to use the **dark colour ball pen** to complete their work for scanning
- **Black and white scanning** should be used instead of colour scanning
- All images are **upright**
- For each report, the mark should be given using a **10-point scale**.
- Attach the **task sheet** (and checklist if any) to the student work.
- Put all the reports of a student in one image/pdf file instead of 1 file for 1 report.

Biology SBA requirements

- Practical Skills (Area A) (8%)
  - Best TWO marks obtained in Area A regardless of the types
- Reporting of Investigative work (Area B) (12%)
  - Best TWO marks obtained from different topics in Area B1 (Experimental Design)
  - Best TWO marks obtained from different topics in Area B2 (Results and Discussion)
- To ensure SBA is conducted throughout the study as a continuous assessment, the system required at least one assessment in each area (A, B1 and B2) to be submitted in S5 and S6 respectively.

2026 Biology SBA schedule

Month/Year	Task
Sep 2024 – Jun 2025	S5 SBA activities to be conducted by schools
May 2025 – June 2025	Email ‘S5 Lists of experiments for 2026 Exam” to DC

Reminders for Area B

- Writing up of procedure is not required
- Assessment on Experimental Design (B1) and Results & Discussion (B2), each with a 10-point scale of marking
- For each experiment, teachers may assess B1 only, B2 only, or both B1 and B2, depending on the nature of the experiment
- Report can be in form of worksheets or paragraph forms

SBA requirements for repeater / transfer candidates

- School repeaters / transfer students for S6 need to meet a minimum of one assessment in each area (A, B1 and B2). For details, please refer to 2.1.2 Requirements for Repeaters and Transfer Students in SBA Teachers' Handbook.

For students with Special Educational Needs (SEN)

- Accommodation
- Applying for exemption (if applicable)

Accommodation

- Provide necessary assistance to the student concerned and perform a FAIR assessment
  - Extension of preparation time
  - Extension of assessment time
  - Provision of ancillary aids
  - Provision of special assistance during the conduct of the assessment
  - Provide alternative task (but same level of difficulty) and perform a FAIR assessment

  (e.g. making reference to School's SEN policy, soliciting advice from school management/Psychologist/Therapist)

Exemption

- Formal approval from the HKEAA required
- Application form: https://www.hkdse.hkeaa.edu.hk
- Apply at the beginning of school year
- Supporting documents
  - School's recommendation for exemption
  - Relevant Medical supports, Psychologist's supports, Attendance record (e.g. record of extended sick leaves)

Reminders

- Contact the SBA Team of the HKEAA for questions related to logistical arrangements
- Discuss with your District Coordinator for subject-related questions
- Explain to the student the accommodation, or why no accommodation is necessary
- Mark in the student work the kind of accommodation / exemption involved if being selected to be submitted to the HKEAA

References

SBA Teachers Handbook

- https://www.hkeaa.edu.hk/DocLibrary/SBA/HKDSE/SBAhandbook-2025-BIO-E_Aug2023.pdf (ENG)
- https://www.hkeaa.edu.hk/DocLibrary/SBA/HKDSE/SBAhandbook-2025-BIO-C_Aug2023.pdf (CHI)

Information on SBA Booklet

- https://www.hkeaa.edu.hk/DocLibrary/Media/Leaflets/SBA_booklet_eng.pdf (ENG)
- https://www.hkeaa.edu.hk/DocLibrary/Media/Leaflets/SBA_booklet_chi.pdf (CHI)

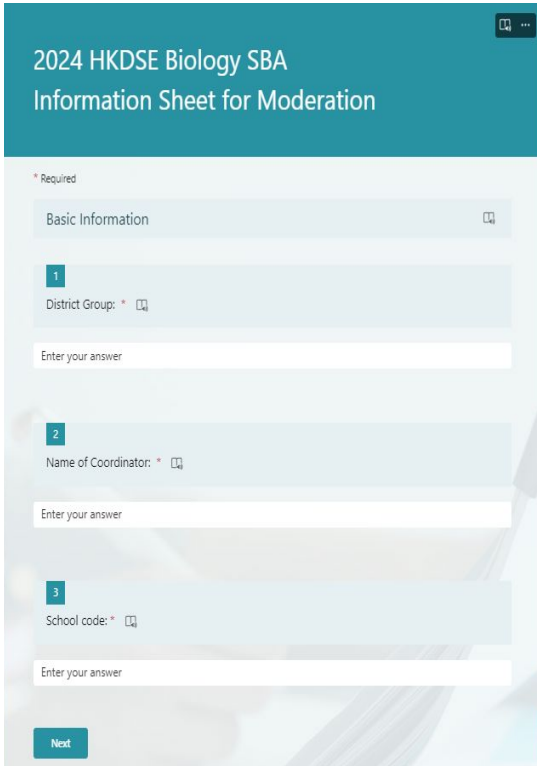
Review on 2024 SBA

香港考試及評核局
Hong Kong
Examinations and
Assessment Authority

Review on 2024 SBA

First DSE cohort using the new format

- 2X B1 Sample Task (with lab manuals)
- B2 Assessment Guidelines updated



Analysis of the tasks submitted by the schools

(*N* = 753)

Review on SBA implementation

Topic of Assessment

Topic	No.	Topic	No.
• Molecules of life	23	• Gas exchange and transport in human	5
• Cell	14	• Reproduction, growth and development	7
• Movement of substances across membrane	205	• Coordination and response	0
• Enzyme	183	• Ecology	4
• Photosynthesis	104	• Health and disease	3
• Respiration	41	• Applied ecology	1
• Genetics	0	• Microorganisms and humans	3
• Gas exchange and transport in plants	28	• Biotechnology	1
• Nutrition in human	127	• Others	1

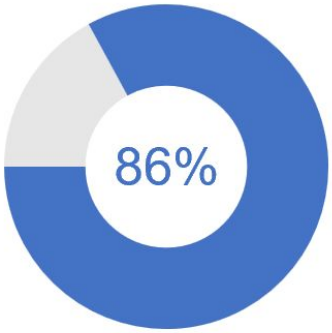
* For 3 tasks, the DCs did not indicate the topic. The total number is 750.

Review on SBA implementation

Area of Assessment

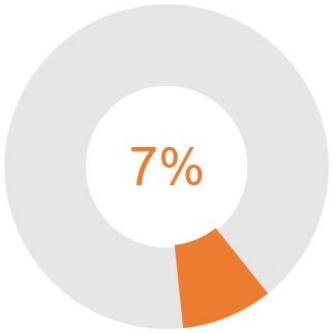
All Tasks

N = 753



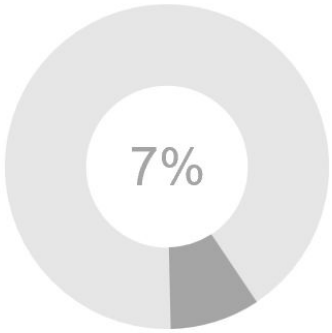
BOTH Areas
B1 and B2

N = 650



Area B1 only

N = 54

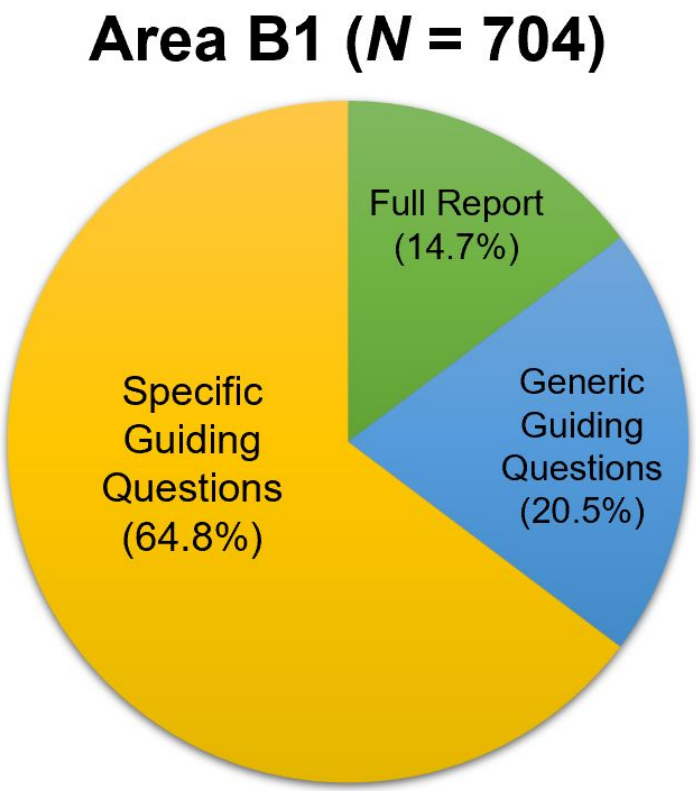


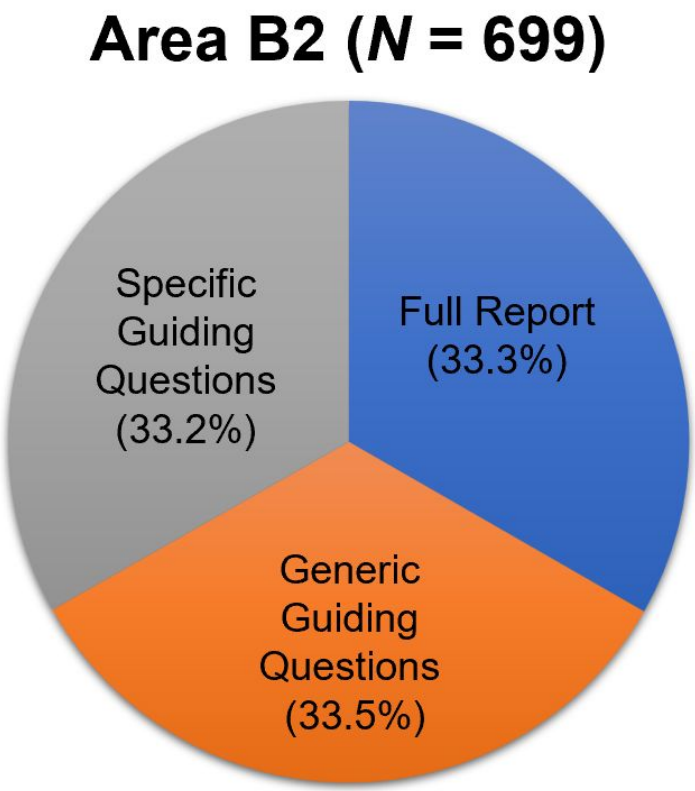
Area B2 only

N = 49

Review on SBA implementation

Format of Assessment



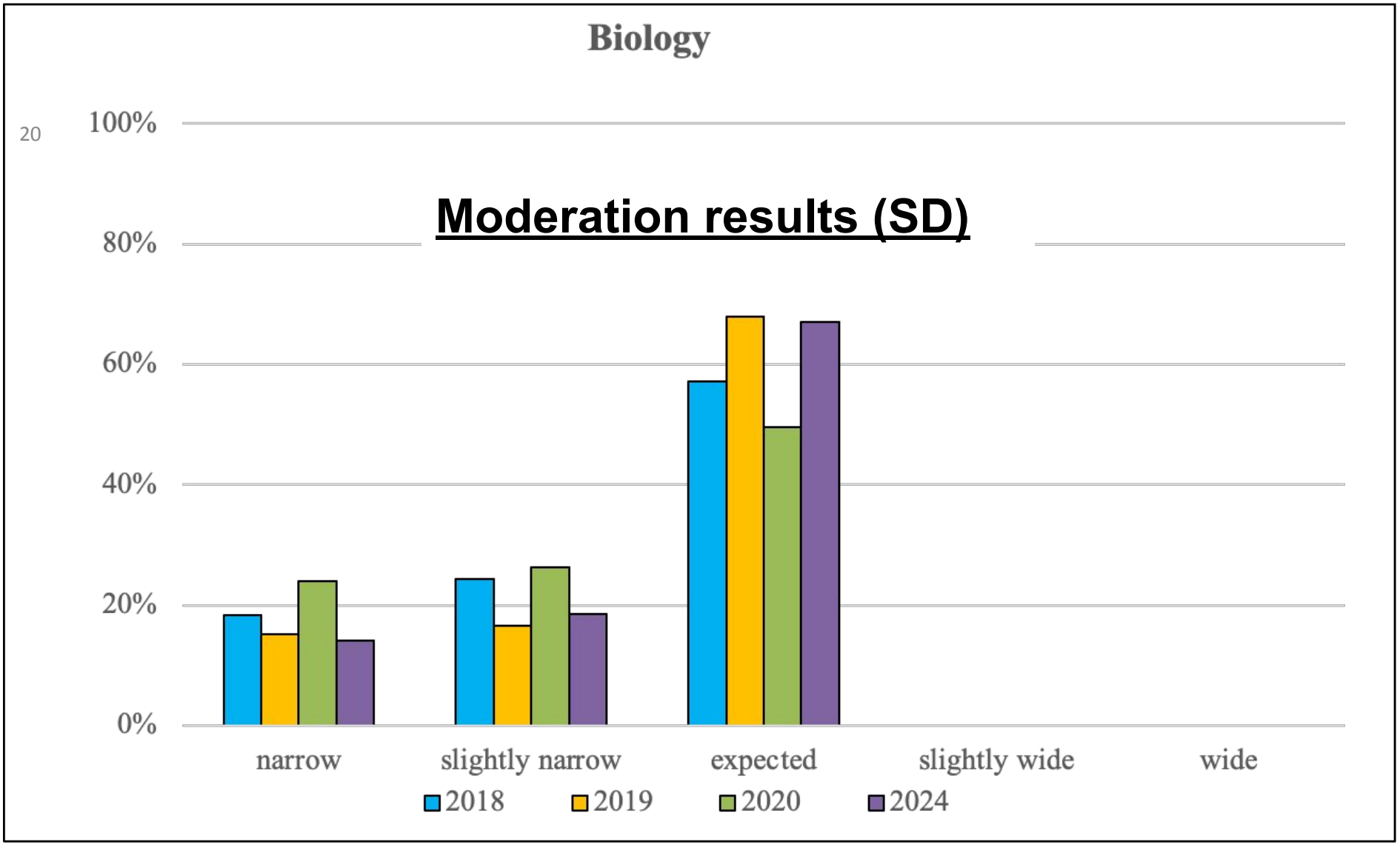


Review on SBA implementation

Moderation results

Comments	Mark adjustment	%
Much lower than expected	18 or more	0.0
Lower than expected	12 – 18	1.1
Slight lower than expected	6 – 12	10.8
As expected	-6 – 6	58.3
Slight higher than expected	- 6 – -12	17.9
Higher than expected	-12 – -18	7.6
Much higher than expected	-18 or more	4.3

Review on SBA implementation



2022 DSE Biology Q31

Directions: Questions 30 and 31 refer to the investigation below. Diagram I shows a set-up for measuring the transpiration rate of a leafy shoot under different environmental conditions. For each treatment, the experiment was conducted for three hours. Table II shows the initial and final readings of the water level in different treatments.

Diagram I

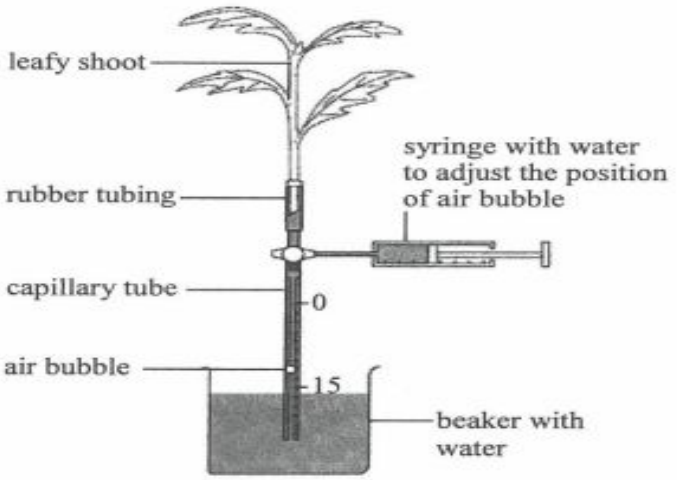


Table II

Treatment	Environmental conditions		Initial reading (cm)	Final reading (cm)
	Light intensity	Humidity		
1	Low	Low	14	7.4
2	Low	High	15	12.5
3	High	Low	15	5.6
4	High	High	14	10.6

30. In which treatment does the leafy shoot have the highest transpiration rate?

A. 1
B. 2
C. 3
D. 4

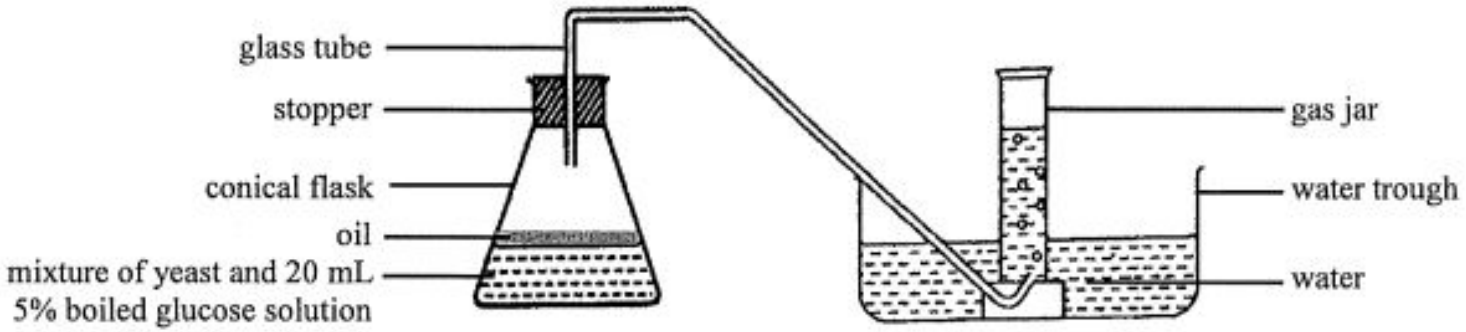
31. According to the results of the investigation, which of the following changes in environmental conditions will lead to a greater reduction in the transpiration rate of the leafy shoot?

A. At low humidity condition, adjust the light intensity from high to low.
B. At high humidity condition, adjust the light intensity from high to low.
C. At low light intensity, adjust the humidity from low to high.
D. At high light intensity, adjust the humidity from low to high.

Drawing valid conclusion

2023 DSE Biology Q8

Directions: Questions 7 and 8 refer to the diagram below, which shows a set-up used to investigate the rate of respiration in yeast:



7. Which of the following word equations correctly shows the reaction being investigated?

A. glucose → carbon dioxide + water
B. glucose → carbon dioxide + ethanol
C. glucose + oxygen → carbon dioxide + water
D. glucose + oxygen → carbon dioxide + ethanol

8. Which of the following modifications about the set-up can improve the accuracy of the experiment?

A. use a measuring cylinder instead of a gas jar
B. use a larger conical flask to contain the mixture
C. use a glass tube with a smaller internal diameter
D. use 30 mL instead of 20 mL of 5% boiled glucose solution

Measurement

2024 DSE Biology Q30

Directions: Questions 30 and 31 refer to an investigation about the effects of auxins on the growth of shoots. 10 mm sections of shoots were obtained from a number of seedlings. Auxin solutions of different concentrations were prepared. Three shoot sections were put into each solution for two days. The results are shown in the table below:

Auxin concentration (ppm)	*Length of the shoot section after 2 days (mm)*		
	Shoot 1	*Shoot 2*	*Shoot 3*
0	15.0	14.5	15.1
0.1	32.5	32.4	32.2
1	37.1	37.2	10.1
10	24.0	23.9	23.8
100	12.5	12.5	13.0
1000	10.0	9.8	10.3

30. Based on the above results, which of the following is the lowest auxin concentration that inhibits the growth of the shoots?

A. 0.1 ppm
B. 10 ppm
C. 100 ppm
D. 1000 ppm

Control set-up

New format of the SBA (from 2027 HKDSE)

- B1 remains unchanged (i.e., same as 2024 and 2025 HKDSE).
- The new B2 Assessment Guidelines should be used.
- The draft version of the SBA B2 Assessment Guidelines can be found on School-based Assessment Conference Materials 2024-2025 p. 3-6. Please note that the guidelines may be slightly modified based on student samples collected and consensus marking.

Further support to teachers in the future

香港考試及評核局
Hong Kong Examinations and Assessment Authority

Further support to teachers in the future

Time	Activity
Early 2025	• Understanding of B1/B2 criteria + Tasks for teaching and learning/assessments of SI skills
March/April 2025	• SBA Conference 2 (Scoring samples) + DC facilitated sample scoring workshop
Mid 2025	• Use of digital tools for data analysis for B2

Future plan and initiatives

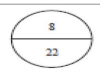
Workshop on SI skills assessed in SBA and written exam

08 HL IBDP

1. The influence of plant volatiles (airborne chemicals released by plants) on other plants was investigated using dodder (*Cuscuta pentagona*). Dodder is a vine-like weed with no leaves and little photosynthetic ability. It robs other plants of their nutrients by attaching to their shoots and leaves above ground.

In a series of experiments, 30 newly germinated dodder seedlings were placed at the centre of a damp filter paper disc. A potential target was positioned near the edge of the disc. Seedlings were allowed to grow for four days. Seedlings' growth across the disc was then recorded by tracing their location on the filter paper. Results for experiments are shown in the diagrams below. The black dots represent the final positions to which the seedlings grew.

Figure 1: Filter paper showing results of dodder seedling growth responses

	Filter paper results		
	Experiment 1	**Experiment 2**	**Experiment 3**
Target	moist soil	20-day-old tomato plant	cotton saturated with tomato volatiles
Tracings of seedling growth responses			
Target Position	×	×	×
Tracing counts of disc halves	 16 / 14	 6 / 24	 8 / 22
Tracing counts of disc quarters	 6 / 7 / 11 / 6	 4 / 7 / 4 / 15	 2 / 7 / 4 / 17

[Adapted from Runyon et al, "Volatile Chemical Cues Guide Host Location and Host Selection by Parasitic Plants", Science, vol. 313, issue 5795, pages 1964–7. Reprinted with permission from AAAS.]

(a) (i) Calculate the percentage of seedlings that grew towards the target in experiment 1 and in experiment 2. [1]

Experiment 1: .....

Experiment 2: .....

(ii) Compare the results of experiments 1 and 2. [2]

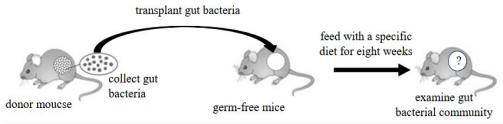
.....

(b) State the purpose of experiment 1.

.....

IB

3(b) Recently, increasing evidence linking obesity to the gut bacterial community has been reported. To investigate the interrelationship between diet, gut bacterial community and energy balance, a group of germ-free mouse siblings received a transplant of gut bacterial community from a donor mouse, followed by a specific diet for eight weeks. After that, their gut bacterial communities were examined. The diagram below shows the workflow:



(i) (1) Suggest why mouse siblings were used in the investigation. (1 mark)

(2) Suggest and explain *two* experimental procedures which are necessary for producing germ-free mice. (2 marks)

(ii) The following table shows a summary of the treatments and the results obtained:

	Experimental group	*Control group*
Diet of the donor mouse	Diet rich in plant polysaccharides	
Diet used to feed the recipient mice for eight weeks	High-fat and high-sugar diet	Diet rich in plant polysaccharides
Average body mass gained (g)	5.3	1.5
Average body fat (%)	3.7	1.7
Composition of gut bacterial community Key: P Q R S		

(1) Which group of mice represented the obese group? (1 mark)

(2) Describe how
community of

(3) It is known tha
indigestible m
bacteria is like

HKDSE

What SI skills are assessed in these questions?

Future plan and initiatives

Workshop on how to infuse scientific inquiry skills in teaching and assessment

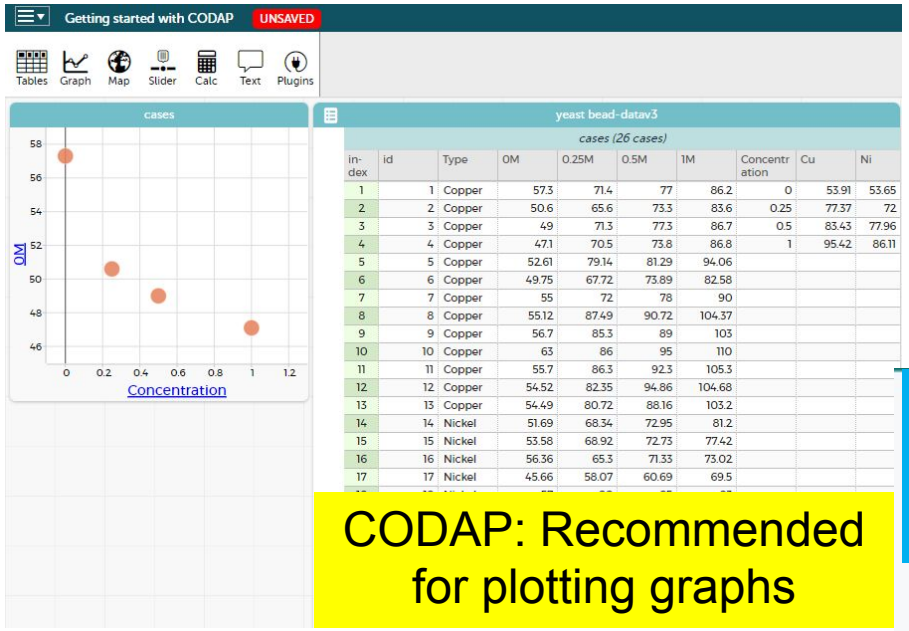
Finding the identities of unknown solution by food test

Finding Vitamin C concentration in plant samples

Milk digestion by Trypsin under different pH

Future plan and initiatives

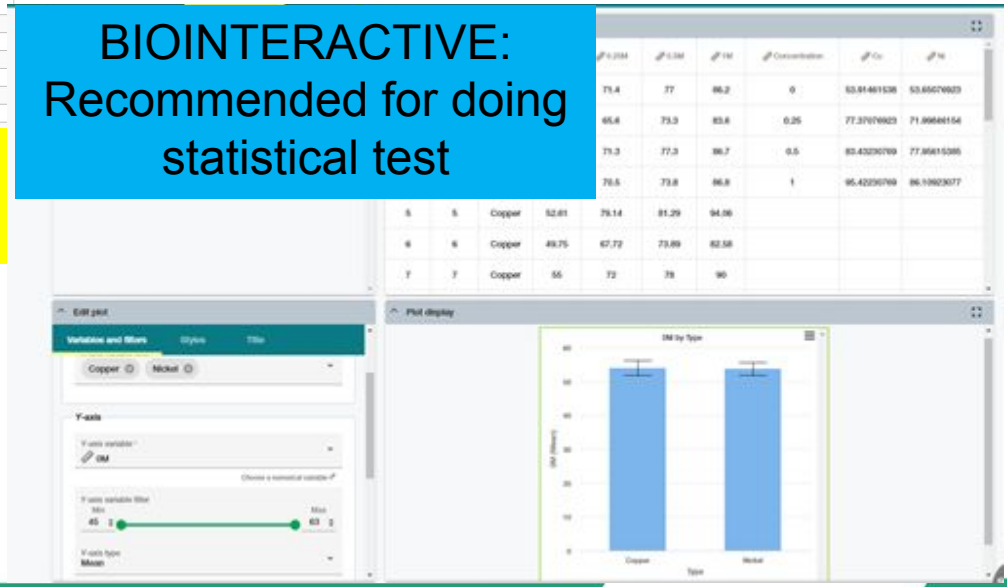
Workshop on use of digital tools for data analysis for B2



index	id	Type	0M	0.25M	0.5M	1M	Concentration	Cu	Ni
1	1	Copper	57.3	71.4	77	86.2	0	53.91	53.65
2	2	Copper	50.6	65.6	73.3	83.6	0.25	77.37	72
3	3	Copper	49	71.3	77.3	86.7	0.5	83.43	77.96
4	4	Copper	47.1	70.5	73.8	86.8	1	95.42	86.11
5	5	Copper	52.61	79.14	81.29	94.06			
6	6	Copper	49.75	67.72	73.89	82.58			
7	7	Copper	55	72	78	90			
8	8	Copper	55.12	87.49	90.72	104.37			
9	9	Copper	56.7	85.3	89	103			
10	10	Copper	63	86	95	110			
11	11	Copper	55.7	86.3	92.3	105.3			
12	12	Copper	54.52	82.35	94.86	104.68			
13	13	Copper	54.49	80.72	88.16	103.2			
14	14	Nickel	51.69	68.34	72.95	81.2			
15	15	Nickel	53.58	68.92	72.73	77.42			
16	16	Nickel	56.36	65.3	71.33	73.02			
17	17	Nickel	45.66	58.07	60.69	69.5			

CODAP: Recommended for plotting graphs

BIOINTERACTIVE: Recommended for doing statistical test



Important dates for public exam (Tentative)

Month/Year	Event
Nov – Dec 2024	Markers Recruitment
14 April 2025	DSE Biology Examination
25 April 2025	Markers' Meeting
30 April 2025	OSM training