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Enhancing secondary school students' awareness regarding the beneficial and harmful effects of insects.

تنمية الوعى بمنافع و أضرار الحشرات لدى طلاب المرحلة الثانوية

Hesham Ashraf Ali, Mahmoud Abdeen Hashim, Marwan Ahmed Sayed, Marwan Ashraf Sayed, Youssef Ahmed Attia.

Supervisor: Rabab Magdy Abd–Elgawad, Assistant Professor of Entomology

Ain Shams University, Faculty of Education, Program: Bachelor of Science and Education (preparatory and secondary), specializing in biological sciences

Abstract

Background: Regarding insects' public health problems, awareness and knowledge are keys to reducing their harmful effects in the environment. Objectives: This study aims to increase awareness among secondary school students about the benefits and harms of insects, and to promote safe control methods for harmful species through informal education. Methods: A survey study was conducted to assess students' baseline knowledge and awareness. Seminar with a presentation on insect characteristics and importance was introduced. Workshops were held on planting insect–repelling herbs like basil and demonstration of biological traps for insects. After that, post–questionnaire was used to measure knowledge and awareness improvement. Results: Before the program, the percentage average of correct answers was 47.06%. High percentage of incorrect or undetermined responses were recorded indicated limited knowledge and many misconceptions. After the program, the percentage average of correct answers and positive awareness responses increased to 90% and 57.66% respectively, that indicates significant improvement in understanding and attitudes. Conclusion: Informal educational methods such as seminars and workshops significantly improved students' knowledge and emotional attitude toward insects. Recommendation: There's a need to continue holding interactive awareness activities in schools to focus on sustainable pest control and health awareness.

Key Words: Insects, Awareness, School activities, Health care.

1. Introduction:

All humans have different perceptions of animals and a wide range of feelings toward them. Students, during their formal education, reflect the perceptions of animals that are most commonly found in their culture (Almeida *et al.,* 2017). Some of these negative perceptions are partly akin to misconceptions, as they are resistant to change through conventional teaching strategies (Prokop *et al.,* 2009) and often conflict with scientific aspects. The public's attitude toward insects, particularly those that can sting, is characterized by aversion and fear. More positive attitudes were expressed when the taxa had aesthetic value, such as butterflies, or practical value, like bees (Kellert, 1993).

Insects represent 73% of the total described fauna and, being linked to every ecosystem function, play key roles in biodiversity resilience (Leandro and Jay–Robert, 2019). Despite their small size, insects are vitally important for the environment and for us (Cardoso *et al.,* 2011, 2020 & Habel *et al.,* 2019), as they provide a vast number of ecosystem services, such as water purification, nutrient cycling, and soil formation (Samways, 2019). Insects are considered a future food source that could help mitigate hunger and malnutrition (Guiné *et al.,* 2022). Insects can also be used for biodiesel production (Wong *et al.,* 2018). Losey and Vaughan (2006) estimated the annual value of only four services (dung burial, pollination, pest control, and recreation) to be more than $57 billion in the United States.

Misinterpretations of the economic importance of insects are frequent, as in the case of the considered insects are only harmful organisms transfer illnesses and diseases. Students do not know the difference between insects and other arthropods and have misconceptions about insects (Bae *et al.,* 2013; Alhadidi, 2022; & Sitar and Rusu, 2023)

In this study, we found that the Egyptian curricula do not provide a complete description of insects and their economic importance. Therefore, we conducted this research to raise awareness among secondary school students about the true nature of insects, emphasizing that not all insects are harmful, as some believe. Harmful insects are only a small part of the insect world, as most insects are beneficial to humans. In this study, two approaches were used to achieve the research objectives.

1- Identify and survey students' knowledge of insects, their awareness of their benefits and harms, and the methods they use to control harmful insects, preserve public health, and protect the environment.

2- Design a set of activities and practices that help to develop students' awareness and emphasize their active role in keeping health care and safe environment.

2. The Theoretical Framework

Around the world, many scientific literacies were contributed to survey people's understanding and awareness of insects, helping to rebuild ingrained negative cultural perceptions and raising awareness of concepts of insects, economic importance of insects, changing attitudes toward insects, and conservation of insects.

In Korea, Bae *et al.* (2013) examined people's understanding and awareness of insects among students and adults. They found that around 50% of people had wrong ideas about insects, but students and those who had experience with insects made fewer mistakes than adults and those without experience. The most common mistake was about the basic body parts of insects. Understanding of insects was different depending on age, gender, and experience. The study showed that having experience with insects had the biggest effect on awareness. These results suggest that getting people more interested in insects and using them in therapy could help improve mental health.

In Iraq, Alhadidi (2022) revealed that while public knowledge of insect concepts is average, awareness is slightly higher. Socio-demographic factors, including gender and studying entomology, showed no impact on awareness. However, rural participants understood insects better than urban ones, and surprisingly, university students knew less than non-students. The findings highlight a lack of understanding, especially among university students and those who studied entomology.

Sitar and Rusu (2023) showed that environmental education reshapes attitudes and increases students' awareness of insects. They emphasized the importance of program duration, outdoor experiences, and experiential learning in improving knowledge and attitudes toward insects. The findings provide insights for designing impactful education programs focused on insect conservation.

Kim *et al.* (2024) surveyed 944 people on insect awareness. 33.9% had personal experience, 72.9% raised beetles, and 29.9% visited insect museums. Interest was highest in kids under 10 years (81.8%), seniors (77.8%), and teens (63.6%). Insect phobia scored 2.19/5, suggesting "insect care" in therapy improves attitudes. These findings may enhance the insect industry's image and acceptance. Also, Kaur and Kaleka (2024) reported that insects are highly adaptive but vulnerable to human-caused environmental changes. Educators should raise awareness by highlighting their importance and using familiar species like butterflies.

Improved educational strategies to raising awareness by different animals, especially insects, were reported by Almeida *et al.* (2017). They designed a pre-test and a post-test for primary school students to identify children's empathy with ten animals with a bad image

and to assess both their attractiveness and dangerousness. They concluded that teaching practice could improve children's perceptions of animals with a bad image.

3. Materials and Methods

- Survey questions and methods

The pre-questionnaire used in this study was prepared to assess the perceptions and knowledge of 1st and 2nd grade secondary school students about concepts of insects. The survey was administered to 95 pupils (Fig. 1), including students from:

1- Ismail Al Qabbani secondary school for boys, Al Wayli administration, Cairo Government.

2- AlKaria Alseyahia Aloula Official language school, 6th of October educational administration, Giza Government.

In pre-questionnaire, 28 items were included, as described in detail in Appendix A, which are grouped in two dimensions: D1, knowledge and concepts dimension (14 items) and D2, awareness and emotional dimension (14 items).

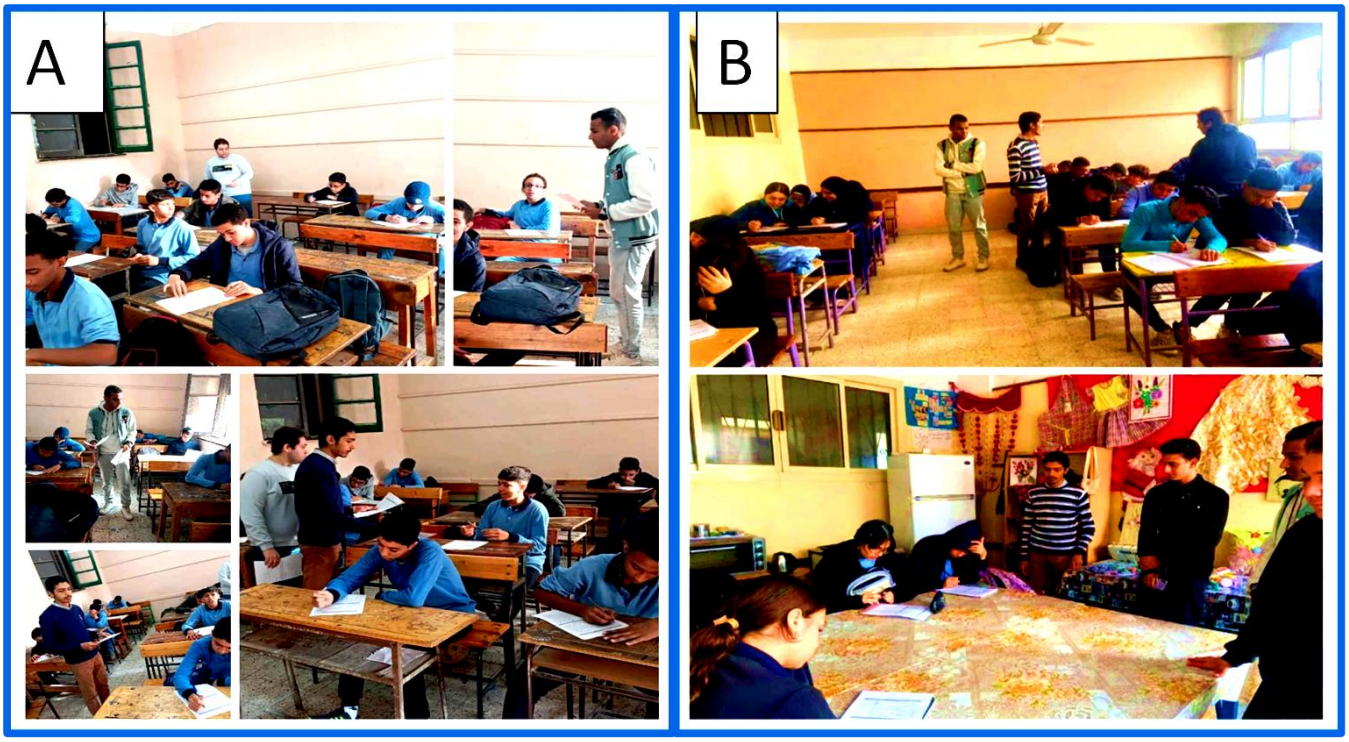

Fig.1 The pre-questionnaire formulated and administered to students in A, at Ismail Al Qabbani secondary school B, at AlKaria Alseyahia Aloula Official language school

All items were evaluated through a three-point Likert scale as follows: in D1, yes, no, and I don't know, and in D2, frequently, sometimes, and rarely. The data collection started in December 2024 and continued to January 2025.

- **Practical**

– a PowerPoint presentation in Appendix B was introduced to students (Fig. 2). During the seminar, some facts and concepts related to insects were explained including the main characteristics of insects, economic importance, pest control methods so that pupils understand the need for using safe pest control methods and raising awareness.

Fig. 2 Presentation introduced to students at Ismail Al Qabbani secondary school

– A workshop was held in March 2025 to plant insect–repellent plants such as basil and mint in the Ismail Al–Qabbani secondary school garden. Some environmentally safe methods for controlling harmful insects such as mosquitoes and flies, were explained (Fig. 3).

Fig. 3 Students during grow insect repellent plants in the garden of Ismail Al–Qabbani secondary school

– A workshop was held in the courtyard of Ismail Al–Qabbani School (Fig. 4) to explain how to use biological traps and their importance in collecting harmful insects and disease–carrying insects.

Fig. 4 Students during a workshop in the courtyard of Ismail Al–Qabbani School listen to and practice how to use biological traps.

– A survey to assess the students' outcomes from what we presented to them during the seminar and workshops. A post–questionnaire was applied in April 2025 to a sample of 50 students at Ismail Al Qabbani Secondary School. Seventeen items were included, as described in detail in Appendix C, which are grouped in two dimensions: knowledge and concepts dimension (5 items) and awareness and emotions dimension (12 items).

- Data analysis

Collected data from questionnaires were converted for coding and analysis with Microsoft® Excel (Office 365) statistical software. Results were expressed as mean ± standard deviation (SD.).

The reliability of the scales for each of the three independent dimensions considered was evaluated through the calculation of Cronbach's alpha, which measures the internal consistency of the different statements evaluated within a certain group. According to Shen *et al.* (2011), the alpha can be interpreted as follows:

Cronbach's alpha coefficient	Reliability
$\alpha < 0.5$	unacceptable
$0.50 < \alpha < 0.60$	weak
$0.60 < \alpha < 0.70$	acceptable
$0.70 < \alpha < 0.90$	good
$\alpha > 0.90$	excellent

4. Results of Research

The data obtained from the pre–survey concerning the knowledge dimension of insects are shown in Table 1 and Fig. 5. The results revealed that the average percentage of correct answers was about 47.06%, while incorrect answers averaged around 31.95%. A notable portion of responses, roughly 20.97% on average, were undetermined. Questions No. 12, 7, and 6 were the easiest; 3, 11, and 1 were the hardest.

Table (1): Responses to the questions of knowledge dimension of insects in pre-survey.

No. of question	Correct answers		Incorrect answers		Undetermined answers	
	No.	(%)	No.	(%)	No.	(%)
1	32	33.68	55	57.89	8	8.42
2	47	49.47	32	33.68	16	16.84
3	17	17.89	75	78.95	3	3.15
4	40	42.11	30	31.58	25	26.31
5	40	42.11	40	42.11	15	15.78
6	71	74.74	5	5.263	19	20.00
7	79	83.16	5	5.263	11	11.57
8	43	45.26	20	21.05	32	33.68
9	17	17.89	43	45.26	35	36.84
10	19	20	32	33.68	44	46.31
11	11	11.58	60	63.16	24	25.26
12	90	94.74	3	3.158	2	2.10
13	62	65.26	11	11.58	22	23.15
14	58	61.05	14	14.74	23	24.21
Mean±(SD.)	44.71±24.72		30.36±22.4		19.93±12.02	
% of total response of 95 students	47.06		31.95		20.97	

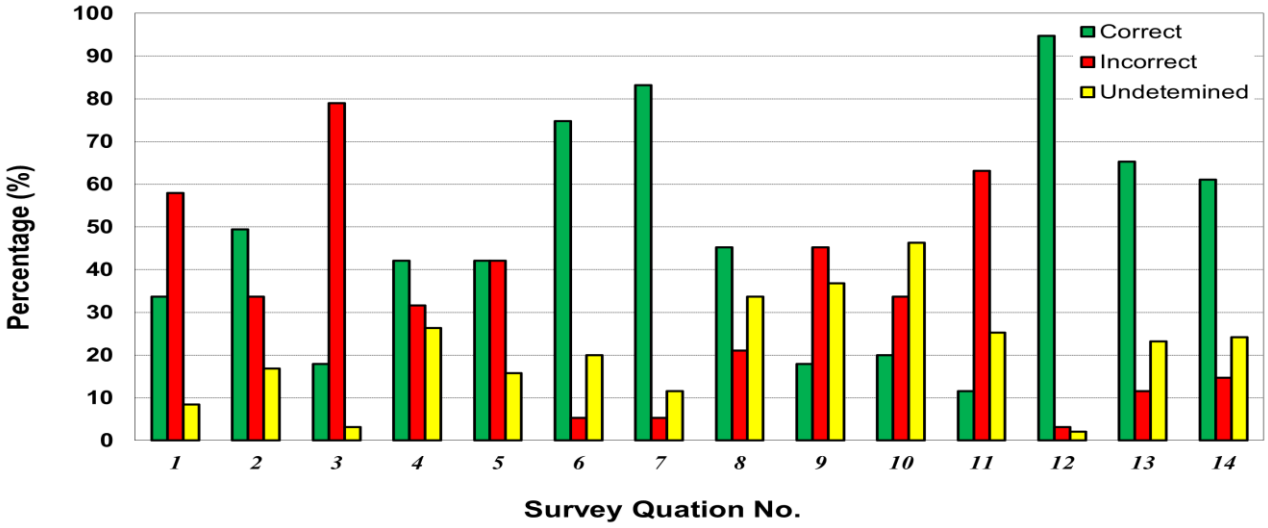

Figure 5: Overall average percentages of responses of knowledge dimension in pre-survey

The data obtained from the pre-survey concerning the awareness dimension of insects are shown in Table 2 and Fig. 6. The results revealed that on average, about 35.11% of responses were positive, 31.20% were negative, and a notable 33.68% were neutral. There's quite a bit of variability in the responses across the different statements, as indicated by the standard deviations (19.09 for positive, 17.9 for negative, and 11.27 for neutral). The Cronbach's alpha for the whole subscale is 0.645, which suggests acceptable internal reliability for this set of questions.

Table (2): Responses to statements of insects Awareness dimension in pre-survey

No. of question	Positive responses		Negative responses		Neutral responses	
	No.	(%)	No.	(%)	No.	(%)
1	21	22.11	13	13.68	61	64.21
2	33	34.74	26	27.37	36	37.89
3	37	38.95	36	37.89	22	23.15
4	41	43.16	19	20	35	36.84
5	15	15.79	46	48.42	34	35.78
6	82	86.32	2	2.105	11	11.57
7	51	53.68	11	11.58	33	34.73
8	45	47.37	17	17.89	33	34.73
9	12	12.63	63	66.32	20	21.05
10	41	43.16	25	26.32	29	30.52
11	10	10.53	53	55.79	32	33.68
12	36	37.89	18	18.95	41	43.15
13	19	20	45	47.37	31	32.63
14	24	25.26	41	43.16	30	31.57
Mean±(SD.)	33.36±19.09		29.64±17.9		32±11.27	
% of total response of 95 students	35.11		31.20		33.68	
Cronbach's alpha for the whole subscale			0.645 indicated acceptable Reliability			

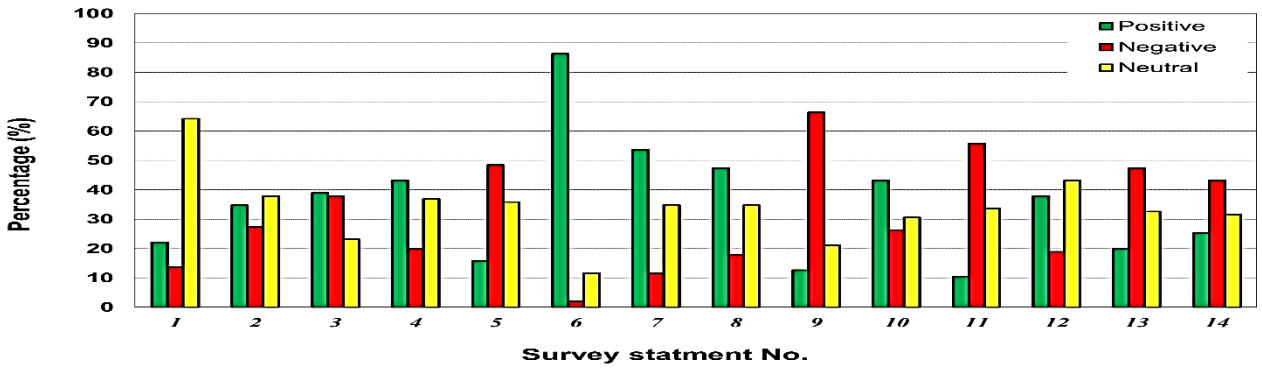

Figure 6: Overall average percentages of responses of awareness dimension in pre-survey.

The data obtained from the post survey concerning the knowledge dimension of insects are shown in Table 3 and Fig. 7. The results revealed that the average percentage of correct answers was about 90%, while incorrect answers averaged around 6.8%. A notable portion of responses, roughly 3.2% on average, were undetermined.

Table (3): Responses to the questions of knowledge dimension of insects in post–survey

No. of question	Correct answers		Incorrect answers		Undetermined answers	
	No.	(%)	No.	(%)	No.	(%)
1	39	78	4	8	7	14
2	46	92	4	8	0	0
3	49	98	1	2	0	0
4	47	94	2	4	1	2
5	44	88	6	12	0	0
Mean±(SD.)	45±3.8		3.4±1.9		1.6±3.0	
% of total response of 50 students	90		6.8		3.2	

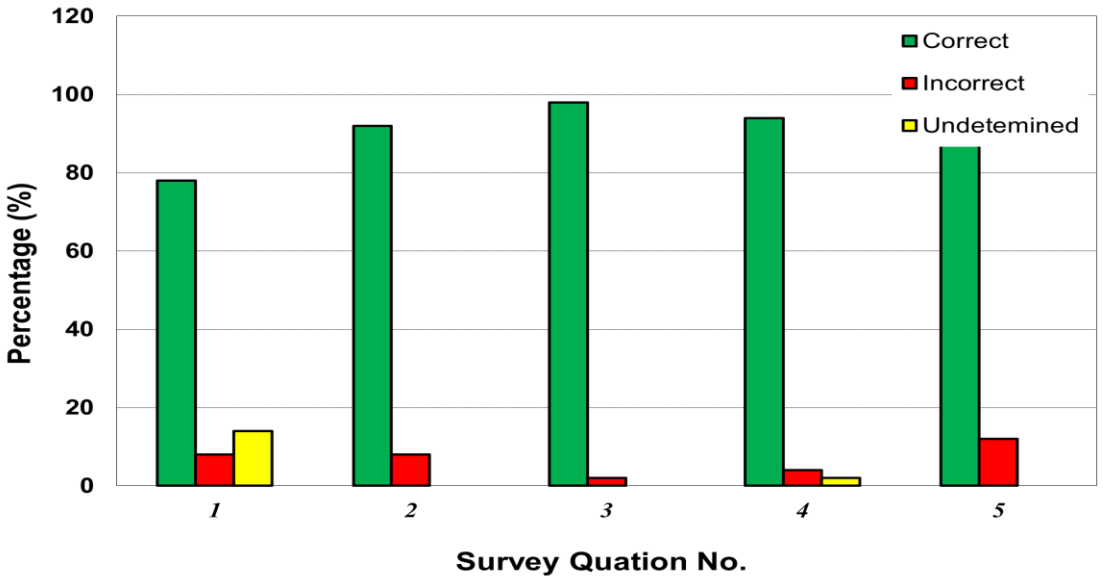

Figure 7: Overall average percentages of responses of knowledge dimension in post-survey.

The data obtained from the post-survey concerning the awareness dimension of insects are shown in Table 4 and Fig. 8. The results revealed that on average, about 57.66 % of responses were positive,

15.33% were negative, and a notable 29.33% were neutral. The Cronbach's alpha for the whole subscale is 0.584, which suggests a weak internal reliability for this set of questions. Positive response for all questions were generally higher than both negative and neutral responses except for question No. 12.

Table (4): Responses to statements of insects Awareness dimension in post-survey.

No. of question	Positive responses		Negative responses		Neutral responses	
	No.	(%)	No.	(%)	No.	(%)
1	41	82	0	0	18	64.21
2	29	58	5	10	32	37.89
3	15	30	15	30	40	23.15
4	38	76	2	4	20	36.84
5	25	50	9	18	32	35.78
6	35	70	5	10	20	11.57
7	21	42	11	22	36	34.73
8	35	70	6	12	18	34.73
9	27	54	7	14	32	21.05
10	45	90	1	2	8	30.52
11	27	54	3	6	40	33.68
12	8	16	28	56	56	43.15
Mean±(SD.)	**28.83±10.7**		**7.66±7.7**		**13.50±5.03**	
% of total response of 50 students	**57.6**		**15.33**		**29.33**	
Cronbach's alpha for the whole subscale			0.584 indicated weak Reliability			

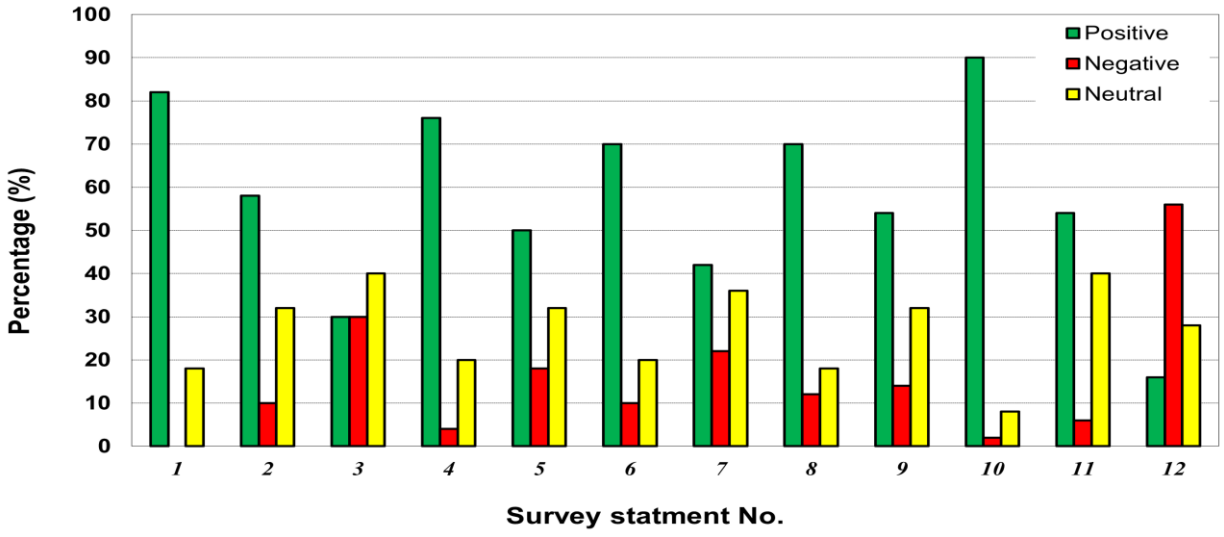

Figure 8: Overall average percentages of responses of awareness dimension in post-survey.

After presenting our awareness seminar, the administration of AlKaria Alseyahia Aloula Official language school installed screens on the windows of the school classrooms in 10th of March 2025 to prevent insects from entering inside classrooms to maintain and improve healthcare for students (Fig. 9).

Figure 9: Installing wire screen on the windows of AlKaria Alseyahia Aloula Official language school.

5. Interpretation of Results

Many studies aimed to increase students' interest in entomology (Weeks & Osero, 2018, Healy, 2019, Markee *et al.,* 2021). In this study, the data from pre-questionnaire indicated that students didn't get most of the questions right. The average percentage of correct answers across all questions was only about 44.71%. This is similar to the findings of Bae *et al.* (2013). They found that around 50% of people had wrong ideas about insects, indicating a general lack of comprehensive understanding. There was a lot of uncertainty. On average, almost 20% of responses were "undetermined," meaning students weren't sure of the answer. Some questions were much harder than others. The results suggest that students lack strong factual knowledge about insects, and their awareness or opinions about insects vary depending on the specific aspect being considered.

In this study, many activities were used to enhance students' awareness about insects. The results indicate that the workshops used in this study were well-received by high school students and they found them informative. This is similar to the findings by Healy (2019) who educates students about various fields of entomology by using workshops. It was obvious that outdoor activities and spending time in natural environments improve the executive attention, reduce the stress level and increase the general quality of learning (Gelter, 2000; Zhang *et al.,* 2014). This explains the data obtained in this study from post-questionnaire where there is an increase in students' knowledge. Also, a change in attitude among students toward insects and a change in the intention to act in an environmentally friendly manner across all evaluated items.

An important role in offering scientific knowledge and shaping appropriate attitudes and behaviours towards insects is played by the approach in the school curriculum. Thus, preconceptions regarding insects, and negative attitudes can be changed through informal education, more precisely through environmental education (Gralton *et al.,* 2004). The lower secondary education students are at a more advanced stage of cognitive development and require more sophisticated strategies that can challenge their critical thinking and problem–solving skills (Sitar & Rusu; 2023). Therefore, the Ministry of Education should insert information about entomology in the Egyptian curricula and provide students with seminars to raise students' awareness.

6. Conclusion

It's important to improve educational strategies to encourage engagement with the environment and promote students' awareness campaigns on the importance of insects for ecosystems and human well–being. This study derives its importance from

1– Its treatment of the lack of informational awareness about insects (their characteristics, importance, and harms).

2– Raising health awareness through how to deal with harmful insects, methods of controlling them, and their impact on public health and the environment.

3– Conduct awareness seminars within the school to raise students' awareness of the beneficial and harmful effects of insects.

4– Designing numerous workshops to help students learn safe methods and alternatives for controlling harmful insects.

5– Raising environmental awareness to achieve sustainable development goals requires significant effort from educational institutions, especially schools and curriculum developers, to increase interest in spreading information and environmental awareness within schools.

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Appendix

Appendix A: The questionnaire used in this study was prepared to assess the perceptions and knowledge of pupils about concepts of insect

Survey

Dear Student,

This questionnaire aims to measure the level of awareness of the benefits and harms of insects among high school students. Please read it carefully and complete it with honesty, objectivity, and academic integrity by marking ✓ the answer that applies to you. Please note that all data and information will only be accessed for scientific research purposes.

Demographic Information:

Name: …….

Grade Level:

- ☐ First year of high school
- ☐ Second year of high school
- ☐ Third year of high school

Gender:

- ☐ MALE
- ☐ FEMALE

Age:

- ☐ Under 16 years old
- ☐ 16 to 18 years old
- ☐ Over 18 years old

Place of Residence:

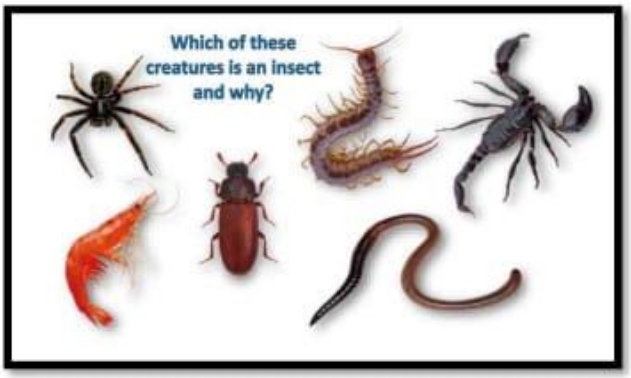
- ☐ CAIRO
- ☐ GIZA
- ☐ OTHERS

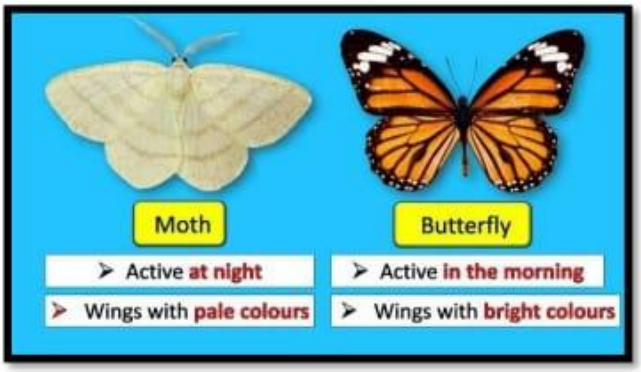
First section: knowledge dimension about insects				
No.	**Statements**	YES	NO	I DO NOT KNOW
1	Are insects considered animals?			
2	Are there insects that live in water?			
3	Are spiders insects?			
4	Do insects have six legs?			
5	Are insects a suitable food source for humans and other living organisms?			
6	Do insects play a role in decomposing and recycling organic matter?			
7	Do insects contribute to maintaining ecological balance?			
8	Are insects used in the production of some medicine and cosmetics?			
9	Are cotton leafworms used in cotton production?			
10	Do flies transmit malaria?			
11	Do bed bugs cause scabies?			
12	Are there insects that feed on other insects?			
13	Are plants used to repel insects?			
14	Are chemical pesticides one of the causes of global warming?			

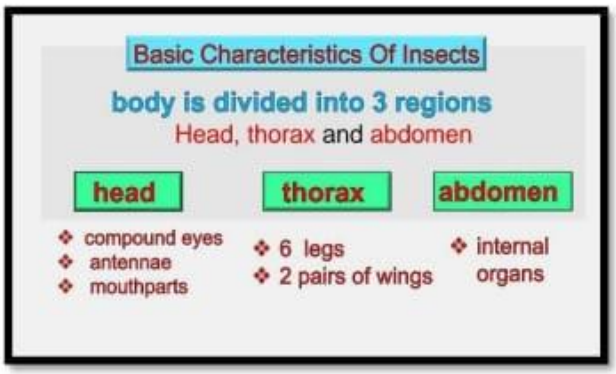
Second section: awareness dimension about insects				
No.	**statements**	**frequently**	**sometimes**	**rarely**
1	I can distinguish between beneficial and harmful insects.			
2	I think about the role of insects when I see them in nature.			
3	I want to learn more about the role of insects in the ecosystem.			
4	I feel anxious and confused when I see insects.			
5	I do my part to conserve beneficial insects.			
6	I take steps to prevent harmful insects from entering my home.			
7	I use environmentally safe methods to control harmful insects.			
8	I am aware of some diseases that insects transmit to humans.			
9	I use chemical pesticides to control harmful insects.			
10	I follow the Ministry of Health's guidelines for preventing insects that are harmful to health.			
11	I read and watch content about insects in books or online.			
12	I believe that school awareness is essential to reduce insect harm.			
13	I enjoy listening to programs on various media outlets about beneficial insects and ways to conserve them.			
14	I like to participate with my colleagues in awareness campaigns to prevent one of the diseases caused by insects			

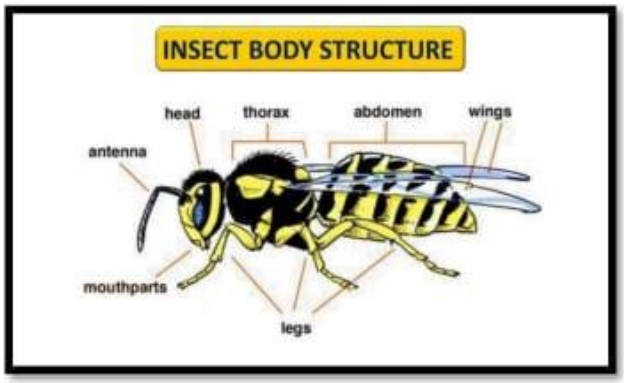
THANK YOU FOR COOPERATION

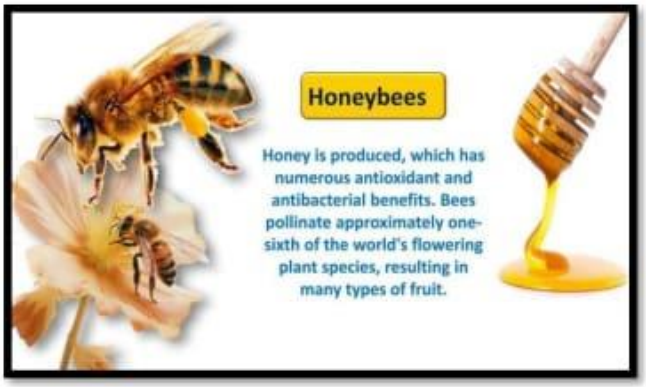
Appendix B: a PowerPoint presentation was introduced to pupils illustrate the main concepts about insects and its economic importance

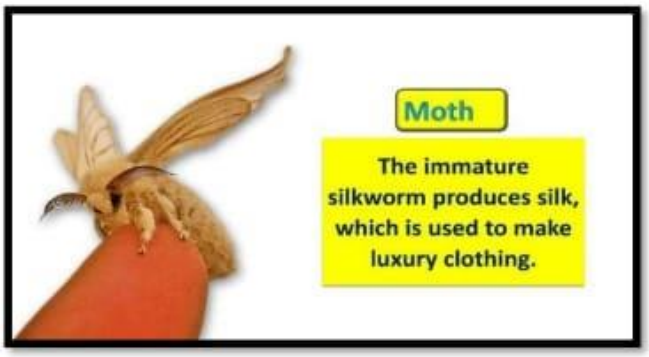


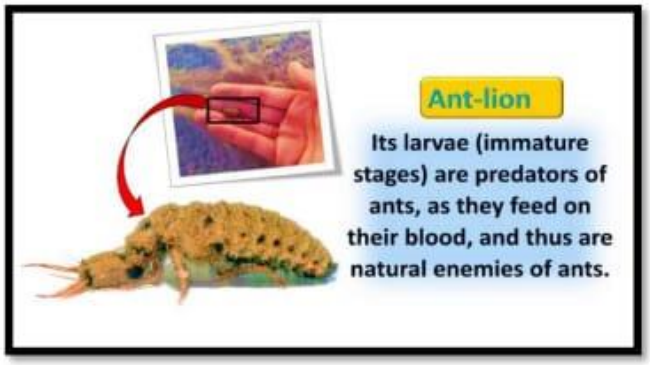






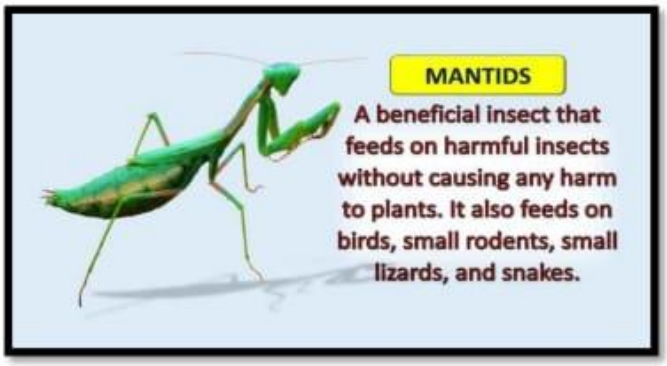



Moth
The immature silkworm produces silk, which is used to make luxury clothing.


Ant-lion
Its larvae (immature stages) are predators of ants, as they feed on their blood, and thus are natural enemies of ants.


Butterfly
It is distinguished by its ability to fly further than bees and thus pollinate flowers across wider areas, and it is also a source of inspiration for artists.


Dragonfly
It feeds on harmful insects such as mosquitoes and flies, thus limiting the spread of diseases transmitted by flies and mosquitoes.

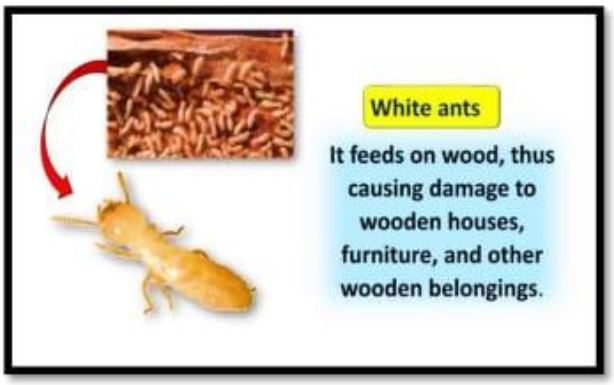

MANTIDS
A beneficial insect that feeds on harmful insects without causing any harm to plants. It also feeds on birds, small rodents, small lizards, and snakes.

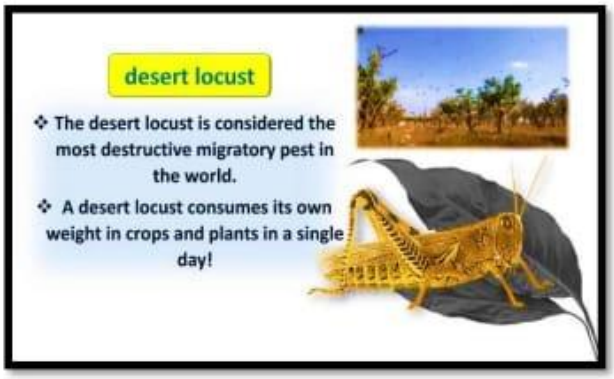

Harmful insects


Ladybird
It is one of the most important biological control insects, as it feeds on some harmful insects, such as aphids, which suck plant sap.


House fly
They carry pathogenic or disease-causing organisms on their bodies and in their feces and can contaminate food and contribute to the transmission of foodborne diseases, including typhoid fever, cholera, diarrhea, and other diseases.

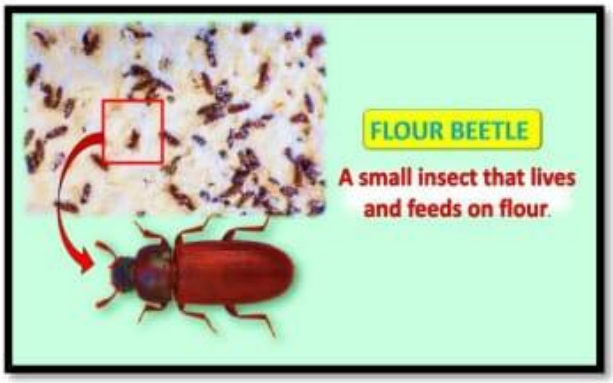

female Anopheles mosquito
They have piercing-sucking mouthparts, feed on blood, and transmit malaria to humans, the symptoms of which include fever, sweating, chills, nausea, and diarrhea.
The World Health Organization has certified Egypt as "malaria-free," a significant public health achievement.


White ants
It feeds on wood, thus causing damage to wooden houses, furniture, and other wooden belongings.


desert locust
The desert locust is considered the most destructive migratory pest in the world.
A desert locust consumes its own weight in crops and plants in a single day!

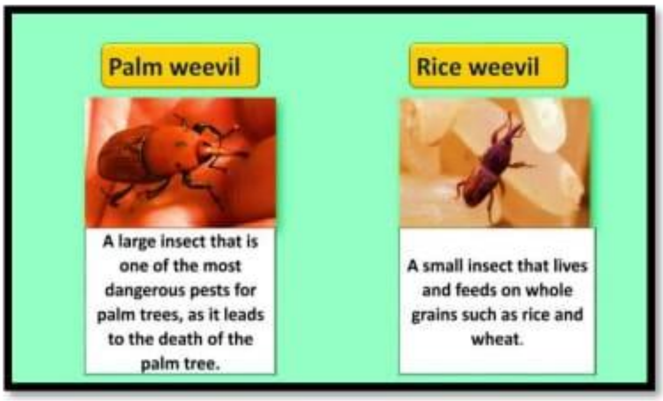

Silver fish
It is a small insect that prefers cool, damp places. Therefore, it is found in abundance in old libraries, where it feeds on the paper of books, crumbling and destroying them. The insect derives its common name from its silvery color and its movements, which resemble swimming fish.


Bed bugs
It has piercing-sucking mouthparts and thus sucks human blood, causing allergic reactions and itching.
Bed bugs are not known to spread any disease, but they can cause an allergic reaction or severe skin reaction in some people.

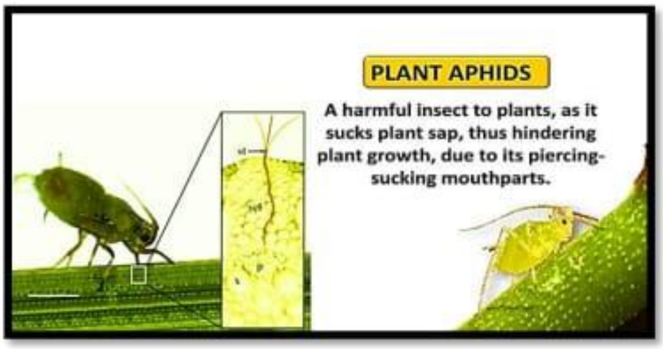

FLOUR BEETLE
A small insect that lives and feeds on flour.


HEAD LICE
Tiny insects that feed on blood from the human scalp. They often affect children and are usually spread by direct transfer from one person's hair to another. They cause an itchy scalp.
Avoid sharing personal items, such as:
Hats and scarves
Hairbrushes and combs
Hair accessories
Headphones
Pillows, towels, and bedding
Louse eggs (nits)

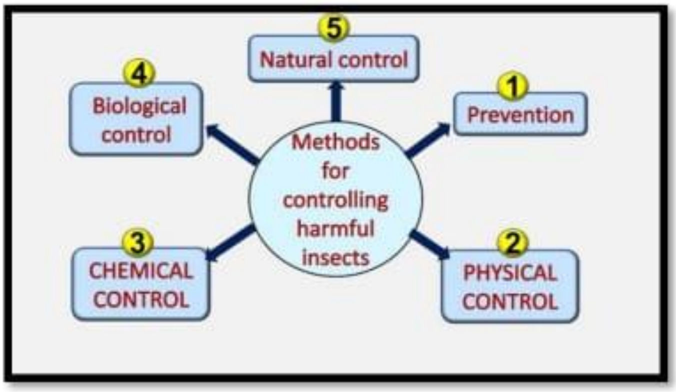

FRUIT FLY
A common agricultural pest in Egypt, it damages ripe fruits and vegetables.
Note:
Fruit flies are widely used in genetics research, making them of great importance in this field!

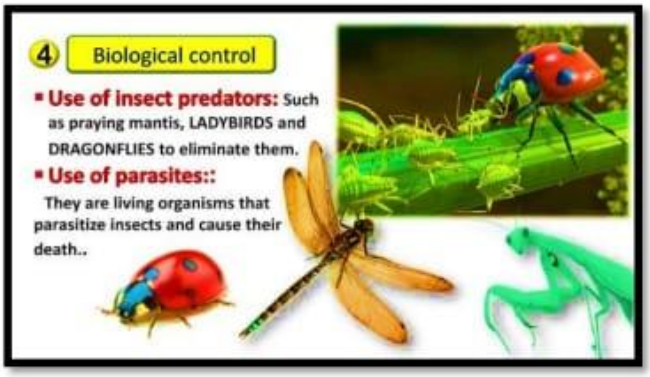

Palm weevil
A large insect that is one of the most dangerous pests for palm trees, as it leads to the death of the palm tree.
Rice weevil
A small insect that lives and feeds on whole grains such as rice and wheat.


2 Physical control
Using insect traps.
Using a light trap:
To attract insects and kill them
Using an electric vacuum: TO KILL INSECTS AND THEIR EGGS
Light trap for flying insects
Electric mosquito zapper
Indoor electronic insect repellent with ultrasonic waves


PLANT APHIDS
A harmful insect to plants, as it sucks plant sap, thus hindering plant growth, due to its piercing-sucking mouthparts.


3 CHEMICAL CONTROL
It is one of the most famous methods of control. Insects are dealt with using chemical materials.
Use of pesticides:
They are chemicals used to kill insects.
Use of insect baits:
They are toxic substances placed in places where insects are found so that they eat and die.
Use of insect repellents:
Like insect repellent sprays.


Methods for controlling harmful insects
1 Prevention
2 PHYSICAL CONTROL
3 CHEMICAL CONTROL
4 Biological control
5 Natural control


4 Biological control
Use of insect predators: Such as praying mantis, LADYBIRDS and DRAGONFLIES to eliminate them.
Use of parasites::
They are living organisms that parasitize insects and cause their death..


1 Prevention
It is the best way to combat insects, and that is through:
Maintain cleanliness: :
Clean the house regularly, dispose of garbage properly, and remove stagnant water.
Seal cracks and holes:
To prevent insects from entering the house.
Using screens on windows and doors:
To prevent insects from entering.
Planting insect-repellent plants:
Such as mint and basil.


5 NATURAL CONTROL
Use of essential oils:
Some essential oils, such as peppermint and lavender, repel insects.
Use of natural herbs:
Some herbs, such as basil and mint, repel insects.
Mint
basil

Appendix C: Post-questionnaire to measure awareness of the benefits and harms of insects among high school students

Survey

Dear student,
This Survey aims to measure your level of awareness after the activities you have undertaken about the benefits and harms of insects, so we ask you to read it carefully, and we extend our thanks to you for observing honesty, objectivity, and scientific honesty by answering the questions. Please note that all data and information will only be accessed for the purpose of scientific research.

First axis: The cognitive dimension of insects				
No.	**Statements**	**Yes**	**No**	**I don't Know**
1	Are insects considered invertebrates?			
2	Is a scorpion considered an insect?			
3	Are silkworms used in silk production?			
4	Does female mosquitoes cause malaria?			
5	Is environmental control a method of controlling insects that harm the environment?			

Second axis: The emotional and awareness dimension				
No.	**Statements**	**frequently**	**sometimes**	**rarely**
1	Do you feel now the importance of beneficial insects in the ecosystem?			
2	Do you have a greater interest in protecting beneficial insects?			
3	Do you use some insect products?			
4	Are you now taking better measures to prevent insects from entering your home?			
5	Do you now use protective methods such as mosquito nets or traps to protect against insects?			
6	Do you listen to awareness tips to prevent the spread of harmful insects and limit their spread?			
7	Are you thinking about using natural methods of pest control such as repellent plants?			
8	Have school activities helped increase your knowledge of insects?			
9	Have you enjoyed watching shows or videos about insects?			
10	Is educating students about beneficial and harmful insects and methods of control important?			
11	Do you think that adding information about insects to academic curricula is important?			
12	Do you talk about insects with your colleagues or family?			

THANK YOU FOR COOPERATION