Eshkol Pais Kiryat Haim presents

"Greenhouse Research"

In cooperation with "Meginim School"

April 2018

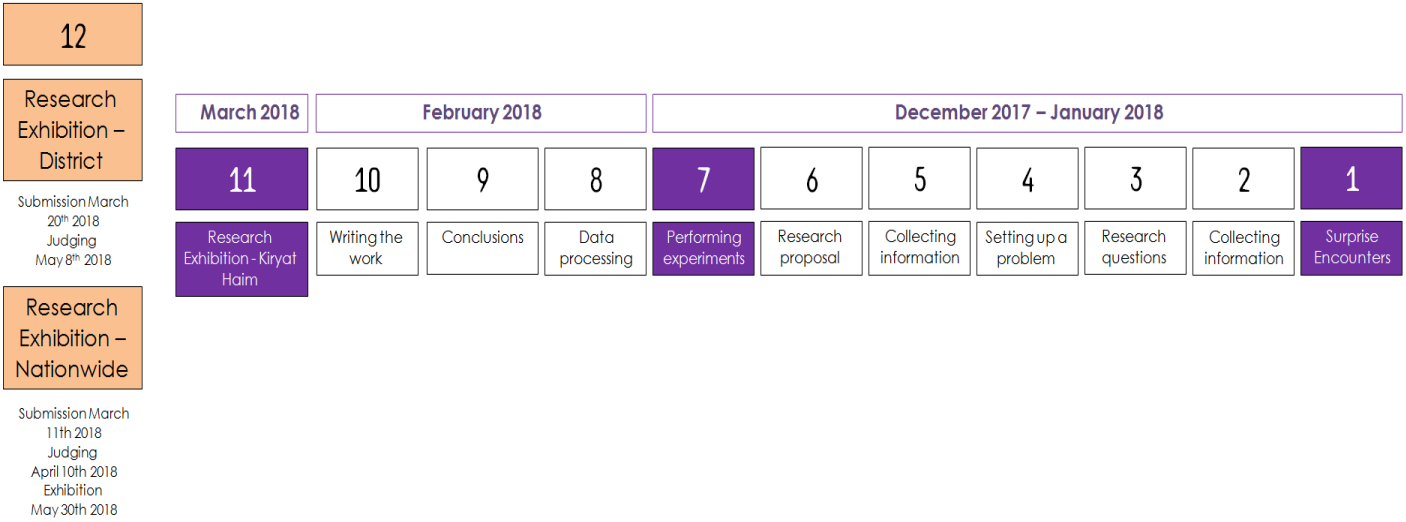
This year, as part of its goal as a scientific greenhouse, Eshkol Pais, Kiryat Haim has decided to establish and expand its activity as a scientific research center for primary school students. In this framework, a unique research program was developed for 6th grade students. In the middle of the series are "Surprise Encounters" which were designed to arouse students' curiosity and encourage them to formulate research questions.

To carry out the research project, for the first time in all its years, Eshkol will open its study labs in the afternoon hours as well, allowing students to perform the experiments independently with the professional guidance of the Eshkol staff.

This unique and enriching scientific program was developed at Eshkol Pais by the initiative of the Science Community of Malal (from birth to matriculation) Kiryat Haim and its collaborators. It is implemented thanks to a dedicated budget and cooperation between the Ministry of Education Haifa District, Malal and the division of Primary Education of the Department of Education, the Education, Culture, and Welfare Administration, and Eshkol Pais Kiryat Haim.

Hagit Mizrahi
Director of Eshkol Pais, Kiryat Haim

Program stages and schedule



Surprise Encounters

The process of research is learned and conducted by a total of seventy-eight 6th grade students.
In the first stage, phenomena that arouse wonder and curiosity are introduced. The purpose of this stage is to expose learners to research phenomena on various topics in order to encourage them to ask pertinent questions and choose a question for research.

Students of excellence in Science 20 students	The rest of the 6th graders 58 students
Marine research	Physical phenomena
Exposure session at Shikmona beach in Haifa - 2 hours	Exposure meeting in Eshkol Pais Kiryat Haim – 2 hours


Canon

Collecting Information

Duration: 3 hours

Location: Classroom

The stage of collecting and writing the information is guided by the Science teacher

1. Asking questions about the phenomenon following the tour / exposure activity.
2. Filtering the questions, sorting by topics, and merging similar questions.
3. Reading sources of information (the Internet, books, encyclopedias)
   Consulting with experts (marine researcher) and providing answers to informative questions.
4. Personal reflection – forming a distinction between informative questions and questions that lead to research activities.

Formulating an inquiry question

Duration: 3 hours

Location: Classroom

What is the effect of the volume of the bottle on the distance of the missile's fall?
What is the impact of water temperature on the distance of the missile's fall?
What is the effect of soil type on the time of a crab digging?
What is the effect of water temperature on the oyster moving?

A clear and focused formulation of the research question that will lead the research:

1. Identification of components, factors (variables) within an existing phenomenon (historical research stories, observation, tour).
   The conceptualization of the concepts - changing factors, an influencing factor, an affected factor.
2. Identifying possible connections between components / factors (impact - affected, cause - effect, similarity and difference).
3. Demonstrating the formulation of a research question while presenting examples of question words that characterize research questions. For example: What is the effect of ... on ...? How does it affect ....?
4. Formulation and examination of research questions according to criteria (based on scientific knowledge, can be tested empirically…).
5. Selecting one research question for research.
6. The research question is approved by the Science teacher and a professional expert.

Formulation of hypotheses investigated

Duration: 2 hours

Location: Classroom

1. Raising possible scientific hypotheses for the inquiry question, while presenting a template for the formulation of a scientific hypothesis (if ... then ...., as much as .... then ...)
2. Examination of hypotheses (critical thinking):
    - Is the hypothesis based on scientific knowledge?
    - Is the hypothesis testable by experimentation or is it observable?


ACHVILLE

Research Planning

Duration: 2 hours

Location: Classroom

1. Learning the skills of planning research using mediation questions:
    - What is the influencing factor? How will we change the influencing factor?
    - What is the affected factor? What "treatments" will we perform on the affected factor?
    - What will be measured in the affected factor? How will we measure the affected factor?
    - Which measuring devices will be used? Which units of measurement will be used?
    - How many test groups will be tested?
    - Will a control group be set up? If so, what? What is its role?
    - Which factor will be different between the groups?
    - Which factors will be constant and identical in all the groups?
    - How many details will be in each experiment / control group?
    - How many repetitions will be performed? Are these rehearsals? (on the measurement, on the experiment), How will the rehearsals be performed?
    - How will the experiment results be organized?
2. Planning an experiment for the formulated research question.
3. Approval of the research plan by the Science teacher and a professional expert.


HIP AND KNEE INFLAMMATIONS
I FEEL
BAD
FOR THE PEOP
Paolo Garage
A-1
B-1
C-1
C-2
C-3
B-3

Conducting the inquiry

Duration: 3 hours

Location: Eshkol Pais

- As planned in advance, students arrived by themselves to Eshkol Pais in the afternoon hours.
- Some of the students were accompanied by their parents to conduct the experiments at Eshkol Pais.
- The students carried out the experiments with the guidance of the Eshkol Pais staff (laboratory technicians), a professional expert, a Science teacher and junior high school students.


DON JUAN

Processing and data representation

Duration: 3 hours

Location: Classroom

At this stage, the data is organized and processed in such a way that it is possible to draw conclusions and give an answer to the research question of study that was raised.

1. Presentation of the tools for representing the data collected in the research and instructing the learners.
   - The qualitative data is expressed in a verbal description, and / or in a photograph
   - Quantitative data (data expressed in numbers, such as: length, current intensity, volume, time) is presented in a table and/or graph accompanied by appropriate measurement units.
2. The students practice collecting data from their research in the computer room.

Discussion and drawing research conclusions

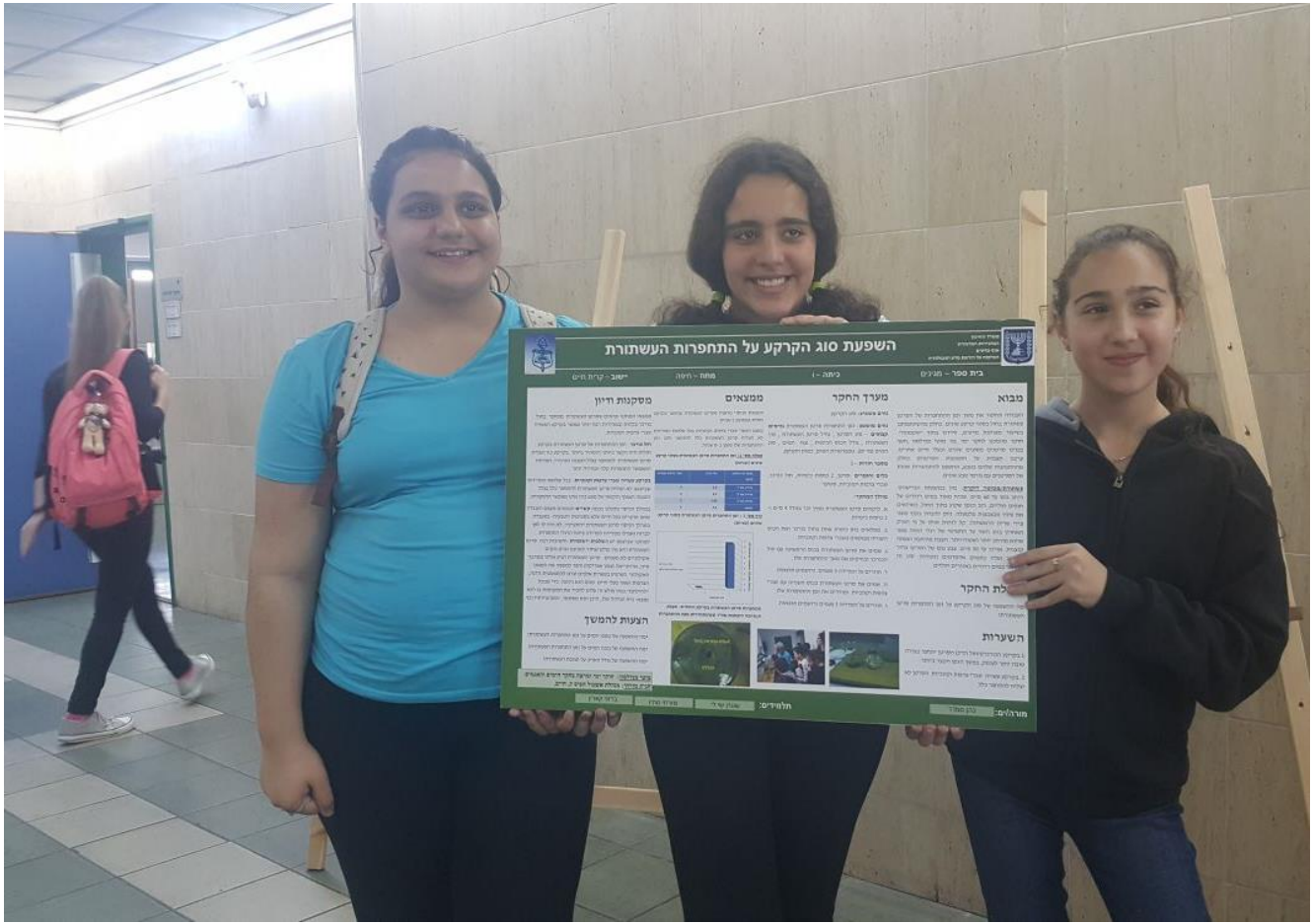
Duration: 2 hours

Location: Classroom

At this stage, one or more conclusions are formulated, hypotheses of the research are substantiated or refuted, and a scientific explanation based on the results of the research is given.

Conclusions:

1. The distinction between outcome and conclusion
2. Reaching conclusions from the results and explaining them based on sources of information.
3. Checking if the conclusion supports the hypothesis (confirmation or refutation)
4. Raising additional research questions in the same context.


השפעת סוג הקרקע על התחפרות העשתורת
מבוא
מערך החקר
ממצאים
מסקנות ודיון
הצעות להמשך
השערות

Writing the work

In the final stage of writing the thesis:

1. Writing an Overview (Introduction)
2. Graphic design
3. Making a scientific poster according to a given and uniform format
4. Checking the work and submitting it to the Kiryat Haim Research Fair

07.03.18

יריד קרית חיים לעבודות חקר מדעי ופתרון בעיות במדע וטכנולוגיה

באשכול פיס תיכון קרית חיים

הזמנה

סדר יום
11:30 - 12:00 התכנסות והתארגנות
12:00 - 13:15 שיפוט עבודות (סבב ראשון)
13:15 - 13:30 הפסקה
13:30 - 15:00 שיפוט עבודות (סבב שני)
15:00 - 15:30 הפסקה
15:30 - 16:00 טקס סיום והכרזה על העבודות המצטיינות

בתמונה:
אור בן ששון
תלמיד כיתה ו
בי"ס מגינים