



An initiative by GROWTHPOINT
PROPERTIES



GROWSMART SCIENCE COMPETITION 2020

INFORMATION FOR PARTICIPATING SCHOOLS

Introduction

Growsmart is an educational programme that hosts inter-school competitions in Literacy, Story Writing & Poetry, Mathematics and Science for learners in Grades 4, 5, and 6. A Debating competition is also hosted for learners in Grade 6. A pilot competition in Entrepreneurship is also being hosted for learners in Grade 6 in 2020. It is a corporate social responsibility initiative by Growthpoint Properties and is supported by the Western Cape, Eastern Cape, and Limpopo Education Departments. The broad purpose of the competition is to promote the importance of education in a practical and fun way that will benefit both the schools and their learners.

The Science competition will run alongside the normal Growsmart Literacy, Story Writing & Poetry, Mathematics, Debating and Entrepreneurship competitions, although it will be completely separate from these.

Growsmart Science competition

The science competition is not compulsory.

Each participating school must select their three learners from Grades 4, 5, and 6 who will form the school team. This can be done through a series of preliminary competitions at the school, conducted by teachers at class level, inter-class level and grade level. The school has the discretion as to how all learners can be encouraged to participate in the selection stage.

The mentor will be the coordinator for their elected competition and for their school and they will ensure that their team is adequately prepared.

There will be a Practise Edition, which is designed to be used for selecting your teams, plus three other editions which will follow prior to each competition level. The concepts will be expanded through stories and activities to be used for reading practice, enjoyment and comprehension.

The mentor will obtain consent from the parents or legal guardians, ensure the team's preparation for each competition round and arrange transportation for the team to the competition venue.

4th Floor | MontClare Place | Main Road | Claremont | Cape Town | Western Cape | 7708

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Your team has over 3 months to prepare your science project.

Two launch presentations will be held on **5 and 6 February 2020** for the various participating Metro Districts in order to help principals and team mentors to prepare for the upcoming competitions. Please make arrangements for transport on this day as you will be receiving the practise and first editions of the Growsmart newspaper at the launch. Not receiving the paper on this day could set your school at a disadvantage.

The competition rounds will begin on **9 May 2020** and will run over a number of months, culminating in the grand finale which will take place on Saturday, **5 September 2020**. Your team will compete at least once on a Saturday in Level 1 and will advance to Level 2 should they win their round. Should they win Level 2, they will proceed to quarter-finals (if necessary) and semi-finals. Winning the semi-final round will result in your team advancing to the final round.

The competition rounds will take place at Oude Molen Academy of Science and Technology in Pinelands and run concurrently with other Growsmart competitions.

Growsmart Scientist competition format

The competition will take place over three different competition levels on Saturdays.

The first two days of the level 1 competition, **9 May and 16 May 2020** are open days to bring the projects to the judges for feedback.

Your science project will be judged on the last two days of the level 1 competition dates, **30 May 2020 and 6 June 2020**.

The objective of the competition is for teams to identify a problem and present their scientific solution. Each of the teams will submit a unique science project.

To prepare for the competition, each team will receive:

- A project display board;
- A journal; and
- Progress report marking rubric (as seen in this document).

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Identifying a problem

Come up with ideas to identify a problem and then think about a possible scientific solution. Think about things that people (whether children or adults) find difficult, frustrating or nuisance. How can we solve the problem?

Topics

1. Are night insects attracted to lamps because of heat or light?
2. Which colour absorbs the most heat?
3. Which Metal Is the Most Resistant to Corrosion? Test several kinds of metal exposed to the air, tap water, and saltwater to determine which are the most resistant to corrosion, and which substances are the most corrosive to them.
4. Keeping Drinks Hot. Ever wonder what factors affect how fast a hot beverage cools? Questions to consider...
 - Does the shape/size of the mug have an effect on the rate at which the liquid cools? - i.e. tall vs. short, narrow vs. wide, etc.
 - Does the composition of the cup have an effect on the rate at which the liquid cools? - i.e. paper, plastic, Styrofoam, glass, clay, stainless steel, etc.
 - How do travel mugs compare? - i.e. double wall insulated vs. single wall, etc.
 - Does the addition of sweeteners and/or cream have an effect on the rate at which the liquid cools?
5. What paper airplane design flies the farthest? stays aloft the longest?
6. How much electronic pollution is there in your home? Can you find a way to measure it?
7. Which type of wood burns the slowest? Which produces the most heat when burned?
8. Which roofing material and color offers the best energy efficiency?
9. Does toothpaste with whitener whiten teeth more than regular toothpaste?
10. How does the type of music that a person listens to while exercising affect how hard he or she works out?
11. How does temperature changes affect the life of a disposable battery?
12. How does the bounciness of a golf ball affect the distance that it will travel?
13. How robotics and solar energy can be used to eventually enhance our lives - i.e. creating a solar-powered robot bug
14. Does recycled paper decompose more quickly than non-recycled paper?

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15. Which type of inside window covering is best for saving energy?
16. Does the colour of light used on plants affect how well they grow?
17. The best insulator to keep ice from melting
18. How does the size of a vibrating surface affect pitch?
19. How does the diameter of the hose affect the speed of water in a siphon?
20. Which types of paper have the least amount of fading in sunlight?

Finding solutions

- Once you have chosen a problem that you would like to solve, it's time to start brainstorming. Create a mind-map with your problem and your possible solution (your invention).

Notes for the Growsmart Science mentor

Important: Use the scientific method.

- Use this process to help your team come up with the ultimate solution to the problem that they have identified.
- Make use of the marking rubric provided to motivate your progress and guidance with the team.
- First things first, your team needs to identify the exact source of the problem.
- Encourage them to ask questions and to figure out which method they've thought of that would most effectively solve the problem.
- This will lead them to come up with a theory about how the problem can be solved. From this point, they can come up with experiments to test the problem and to come up with a solution.
- After enough testing, they should have come up with a project that can be further developed.

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Safety first

- Think safety first before you start. Make sure that your mentor supervises your team.
- Never eat or drink during an experiment and always keep your work area clean.
- Wear protective clothing (e.g. overalls) / equipment (e.g. goggles) if you need to.
- Do not touch, taste or inhale chemicals or chemical solutions.
- Respect all life forms. Do not perform an experiment that will harm an animal.
- All experiments MUST be supervised by your mentor.
- Always wash your hands after doing an experiment, especially if you have been handling chemicals or animals.
- Dispose of waste properly.
- Any project that involves drugs, firearms, or explosives are not permitted.
- Any project that breaks any provincial or national laws are not permitted.
- Use safety on the Internet. Never write to anyone without an adult knowing about it. Be sure to let your mentor or an adult know about which websites you will be visiting or have them help you search.
- If there are dangerous aspects of your experiment or project, like using sharp tools or experimenting with electricity, please have your mentor or an adult help you or have them do the dangerous parts.

Important notice

- The mentor can guide, help and get involved. They can help gather materials, supervise the project/experiment and even help build the display board and/or model. But they can't help during the judging process.
- Teams will be judged on their display board and/or model, and their oral presentation.
- All decisions made by the judges are final and no correspondence will be entered into.

The project display board

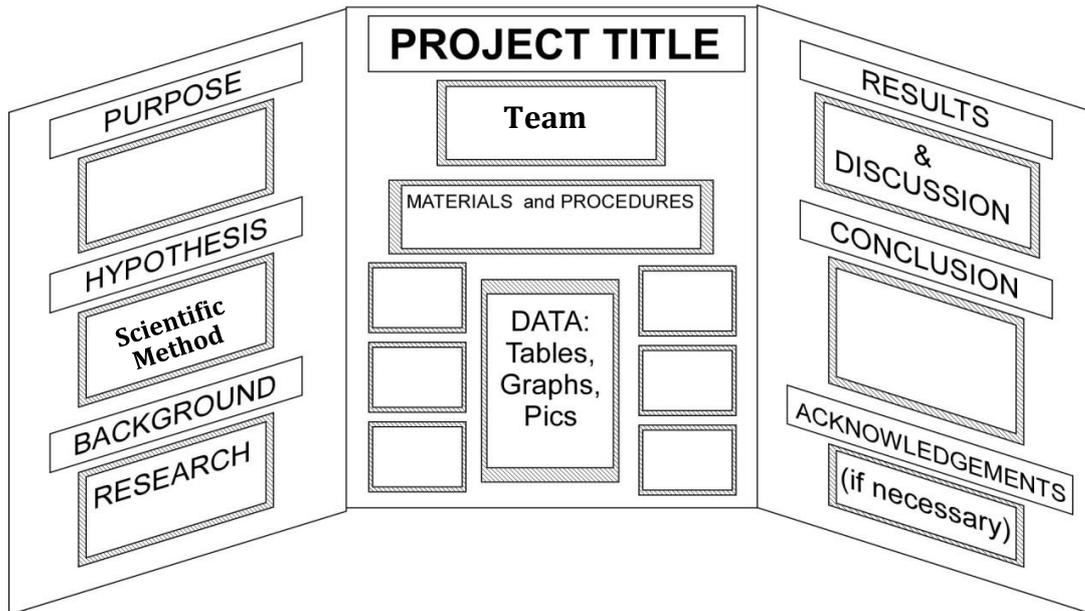
- Items can be mounted on the board, but remember that the board has to be able to stand by itself. Try not to mount something expensive and make sure the things are mounted securely, so they do not fall off.
- **You may not mount any food, organic materials or animals!**

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The model

- Teams may choose to build a model to complement their display board.

The oral presentation

- Teams should try to relax, smile, and have fun.

Helpful hints:

- Dress in your school uniform. Be polite and speak clearly. Do not forget to look at the judges.
- Introduce yourself. Point to the title of your display. Tell the judges why you chose the subject of your project.
- Talk about what you have learnt while researching your project. Talk about the sources (books, websites, interviews, etc.) that helped you understand your topic.
- Explain the steps you took to conduct your experiments, if you did any. Be sure to mention all the materials involved and point out the pictures that you may have taken.

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- Try to sound like an expert on your project. Always use the appropriate vocabulary, especially by using words from the scientific method, such as: problem, hypothesis, procedure, results and conclusions.

Judging process

- Teams receive a competition schedule indicating their competition time slot.
- The interviews take place in 15-minute time slots; 10-minutes are allocated for the interview, followed by a 5-minute period to write down comments and move on to the next team.

Judging criteria

- The projects will be evaluated based on three major criteria:
 - **Scientific thought (60%)** - The judges will evaluate the scientific thought in the design, analysis, and interpretation of the work. New, original experimental research will get marked on a higher level than projects that duplicate existing work.
 - **Originality and creativity (10%)** - The judges will determine whether the project shows a novel approach and uses creativity in its design. Did the student think outside of the box to answer the research question or develop a new prototype, or was there limited imagination put into the project?
 - **Communication (30%)** - Communication is evaluated based on four components: the visual display, the oral presentation, the project report with background research and the logbook. The display, report, and logbook should be logical, self-explanatory, complete, and reflect the student's scientific skill. The oral presentation will be evaluated based on the student's enthusiasm, ability to effectively communicate findings, and ability to answer questions.
- The most weight is given to scientific thought and original creativity.
- The project display and presentation are important in that they should demonstrate the student's ability to communicate concepts, methods, and results relevant to the work presented.
- The prettiness or flashiness of the display is of far less value in the ranking process.
- A launch and workshop information session for principals and team mentors will be hosted at Oude Molen Academy of Science and Technology.

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An electronic online registration form will be emailed to your school for the enrolment of your learners in February 2020. The closing date for registration will be 20 March 2020.

Further details will be communicated to all the participating schools as we approach Level 1 of the competition. Should you have any queries at all, please do not hesitate to contact us on the cell phone numbers below. All the best!

Growsmart Coordinators

Adva Brivik-Prins and Nolwando Feni

GS_Abrivik-Prins@growthpoint.co.za and GS_NFeni@growthpoint.co.za

Landline 021 673 8400

Adva 072 438 2448

Nolwando 079 802 5058

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MARKING MATRIX	
SCIENTIFIC THOUGHT	
RESEARCH QUESTION	
Clear and focused purpose	
The problem is well-understood, the problem is well- defined	
The objectives of the project/experiment are clearly stated	
Sub total	10
DESIGN & METHODOLOGY	
Well-designed plan	
Scientific method, appropriate, completeness	
The chosen approach is innovative	
Sub total	10
EXECUTION	
Systematic data collection and analysis	
Sufficient data collected to support interpretation and conclusions	
Sub total	10
ORIGINALITY & CREATIVITY	
CREATIVITY	
Project demonstrates both originality and creativity (limited - significant)	
Sub total	5
COMMUNICATION	
PRESENTATION/POSTER	
Logical organisation of material, clarity of graphics and legends	
The written language and terminology used are of high quality	
Sub total	5

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PRESENTATION/INTERVIEW	
The presentation is dynamic and enthusiastic	
Clear, concise, thoughtful responses to questions	
All members contribute and understands the project	
Recognition of potential impact on science and society	
Sub total	10
GRAND TOTAL	50