Thematic overview and selection criteria

FOCUS: MATHS AND INQUIRY

Hidden Figures Revealed

The universe of mathematics is packed with hidden patterns, elegant structures, and surprising connections. All are waiting to be uncovered by those who look deeply enough. Take on the challenge of mathematical investigation; uncovering secrets behind number, shapes, and systems. Engage with rich problems, explore advanced concepts, and apply logical reasoning, to reveal the beauty and power that lies beneath the surface. Balancing the satisfaction of rigour with the thrill of discovery, you will harness and develop higher-order thinking and precision and resilience in the face of complexity. You will do away with the monotony of rote solutions as you craft original strategies and test conjectures, much as the often-overlooked figures of mathematics have; both the unsung human pioneers and the patterns that drive innovation today.

Program outcomes

In this program, students will begin with some well-known mathematical concepts and explore their use and application in unexpected and extreme ways. Through the *Hidden Figures Revealed* workshops, students will:

- Think abstractly, connecting cause and effect, and arriving at a logical and justified conclusion.
- Practice higher order thinking skills through developing problem-solving strategies.
- Extend their conceptual understanding of key mathematical concepts and their application in our world.
- Have their curiosity ignited, to encourage further mathematical interest, passion and investigation.

Top 20 prompts for student selection considerations

To assist you (the teacher) in nominating students for this program, we have compiled a series of 20 prompts that may help hone your judgement as to student suitability. Although these prompts are helpful, please remember they are only a guide.

Student selection can be informed by different means, from formal testing and professional reports, through to anecdotal records or observed behaviours.

As this program has been specifically developed for high potential and gifted children, as well as those with a very keen interest and ability in their mathematical skills, the students you select should demonstrate some (but not all) of the following characteristics. It is important to consider that these characteristics may not necessarily be reflected in a student's achievement and performance at school.

A student who is suitable for this program may:

- Possess advanced reasoning and logical thinking skills.
- Demonstrate ability and interest in dealing with abstraction, identifying and recognising number relationships and patterns, drawing connections between concepts, generalising from facts, organising and ordering of information, and inferring meaning.
- Demonstrate advanced spatial reasoning skills i.e., capacity to think about objects in three dimensions and draw conclusions about these using limited information.
- Demonstrate intellectual curiosity, especially with relationships between numbers.
- Demonstrate tolerance for ambiguity and be attracted to complexity.
- Demonstrate advanced visual perceptual skills e.g., visual discrimination, visual memory, visual-spatial relationships etc.
- Often asks questions that begin with 'Why' and 'How'.
- Learn easily, readily and/or rapidly and complete classwork quickly.
- Have a well-developed vocabulary of mathematical terminology and/or numerate memory.
- Demonstrate interest in how machines work, construction processes and other investigative and problem-solving activities.
- Be open-minded when an 'answer' is not obvious.
- Maintain a strong sense of order and/or tends to classify data into organised sets.
- Demonstrate original/divergent thinking, and intellectual risk taking.
- Demonstrate passion and interest utilising mathematical fields outside of the classroom (such as sporting statistics, geographic locations, etc.).
- Demonstrate a substantive attention span, supporting concentration and perseverance with solving problems and pursuing interests (not necessarily school-related).
- Exhibit keen observation skills
- Demonstrate alertness, be highly motivated and respond quickly to new ideas.
- Often use forecasting and predictive skills in pre-empting a result (ideally allowing flexibility for error).
- Demonstrate superior Numeracy knowledge, skills and understanding, particularly those involving problem-solving.
- Enjoy hands-on activities involving manipulatable materials/equipment (e.g., LEGO, card games, etc.)