



KNOX
GRAMMAR
SCHOOL

STATE

DA VINCI DECATHLON 2021

CELEBRATING THE ACADEMIC GIFTS OF STUDENTS
IN YEARS 7 & 8



ENGINEERING

TEAM NUMBER _____

| Questions | Prototype | Total | Rank |
|-----------|-----------|-------|------|
| /10 | /35 | /45 | |

ANY CHANCE OF A HOLE-IN-ONE?

BACKGROUND

Mini golf originated in Europe during the late 1800s as an alternative to the professional and elite sport of golfing. It was quickly commercialised by the United States of America and made into a lively outing for families and teenagers.



While there are now professional leagues of traditional mini golf, ultimately a putting competition, most of us still relate to the childhood memories of fantastical courses themed to jungles, waterparks and fairy tales. It is on these courses where mini golf is no longer a game that can be won by precision, analysis and skill.

For between the starting putting point and the hole are a number of obstacles, many unpredictable and immeasurable. These obstacles create chance and enhance the enjoyment of putters on the course.

A number of competitions exist annually for the best designed and engineered mini golf course holes. Obstacles in courses range from simple sloped surfaces and rubber bumpers to the more complex system of pipes or moving parts. Some of these are shown on page 3. The key challenge for designers is how to implement these systems of chance creatively whilst remaining true to the theming and performance of a course so the putting experience is seamless and transforms the putter into the fantastical world the course is set in.

THE TASK

You have been employed by one of the world's leading mini-golf hole producers to create a scale model of a new mini-golf that will be based on your own sub-theme connected to 'chance'. This scale model must be a functional working prototype designed to sell your hole to courses around the world. It must include a system of hidden pipes with at least two different openings, along with at least one other element of 'chance'. You must also focus on the creative and thematic design: how can you camouflage or stylise these mechanical components to fit with your overall sub-theme.



DESIGN BRIEF

Your mini-mini-golf course hole must:

1. Fit on the A3 baseplate provided but need to be scaled to that size: you may choose to design using a smaller scale that would only take up part of the baseplate.
2. Be based on a sub-theme connected to the idea of 'chance'. Include this sub-theme on the baseplate. You also need to create a name and backstory for your hole based on the sub-theme and answer the questions provided to explain your rationale.
3. Include a system of hidden pipes with at least two openings to surprise first-time putters as to where the golf ball will move to. You may choose to have as few as one entry opening, but there must be at least two exit openings.
4. Include at least one other element of chance (e.g. unusual sloped surfaces, obstacles or swinging/moving parts). Describe these elements of chance on the baseplate.
5. Be designed to match your sub-theme. While marks will not be rewarded for artistic work on the materials provided (e.g. artworks, drawing) you will be marked on aesthetic elements such as shape and colour, which can be indicated rather than actually coloured.
6. Be functional using a golf ball/mini putter that you design using the provided materials. A user should be able to control the putter with their fingers.



DESIGN PARAMETERS

You will have between **80 minutes** to design and construct your mini golf hole prototype. Refer to the marking criteria to inform your design.



At the conclusion of the task, you will take your mini golf course hole to the marking area. If you are competing virtually, your development time will cease after the allocated 80 minutes, but you will have an extra **10 minutes** upload images and a video of your prototype. The images must capture all angles of your prototype and the video must show the functionality of your prototype.

MATERIALS TO BE PROVIDED

You will be provided with a number of materials. It will be up to your team to decide what materials you will use to construct the model property. You are able to select from the following materials:

- 1 piece of A3 cardboard to use as a baseplate
- 6 pieces of A4 paper
- 3 pieces of A4 card
- 6 plastic/paper straws (bendable)
- 4 paper clips
- 100 grams of plasticine
- 8 popsicle/ paddle pop sticks
- Your own sticky tape (use sparingly).

Glue and staples are prohibited and will result in disqualification from the task.

REMEMBER TO ANSWER THE REFLECTION QUESTIONS BELOW

DESIGN ANALYSIS

QUESTION 1) NAME AND BACKSTORY (3 MARKS)

Outline the name and backstory of your mini-golf hole and explain how it links to your sub-theme. Evaluate how effectively the elements of your design illuminate this sub-theme.

QUESTION 2) A LINK TO CHANCE (3 MARKS)

Describe the features of your prototype that create an element of chance and explain their functionality.

QUESTION 3) DESIGN REFLECTION

(4 MARKS)

Reflect on the viability of your design with respect to the design brief. Identify key flaws in your design and propose solutions to these challenges.

END OF PAPER

MARKING CRITERIA

QUESTION BOOKLET

| Question | Skilful | Sound | Limited |
|------------|---------|-------|---------|
| Question 1 | 3 | 2 | 1 |
| Question 2 | 3 | 2 | 1 |
| Question 3 | 4 | 3-2 | 1 |
| Total | /10 | | |

PROTOTYPE

| Criteria | Skillful | Effective | Sound | Basic | Limited |
|---|----------|-----------|-------|-------|---------|
| Design sophistication and build quality of piping element | 6 | 5 | 4-3 | 2 | 1 |
| Design sophistication and build quality of additional chance element(s) | 8 | 4 | 3 | 2 | 1 |
| Physical connectedness to theoretical sub-theme. | 6 | 5 | 4-3 | 2 | 1 |
| Novelty, uniqueness, creativity and originality | 6 | 5 | 4-3 | 2 | 1 |
| Design aesthetics | 3 | 2 | | 1 | |
| Structural build quality | 3 | 2 | | 1 | |
| Use of materials | 3 | 2 | | 1 | |
| Total | /35 | | | | |

TOTAL

| |
|-----|
| /45 |
|-----|