# May the Force be with you!

It is the year 2703 AD and Darth Jason has just piloted his Starship, “Charismatic Cathy”, into the Imperial Deathstar after exploring a new planet (Cattus Georgus) in the outer fourth quadrant of the Infinity Galaxy. After powering down his Probability Drive he will report to the Imperial Dictator, Marcus Baldus.

Darth Jason will describe to the Dictator how the natives of this newly discovered planet plan their daily lives. Using an eight-sided spinner they divide their day into regular increments.



After consultation with Marcus Baldus, The Grand Imperial Leader of the United Universes, President Annette of Arabia, has drafted you (because of your famous mathematical brain) to join a team of mathematical consultants to travel to Cattus Georgus. She has given you three tasks.

**Task 1 (Technology)**

Construct a regular octagon spinner.

* Sum of angles at centre = 3600
* Number of angles at centre = 8
* Each angle at centre = 450
* On cardboard:
* Draw a line (AB) using a ruler
* Using a compass, bisect AB at right angles (O)
* Draw a line (PQ) the same length as AB through O
* Bisect the right angles
* Draw 2 lines through O same length as AB
* Join ends of lines
* You have constructed an octagon with 8 sectors.
* Punch a hole through O large enough to insert a drawing pin or a pencil.
* Beneath the drawing pin insert a paperclip.
* Flick the paperclip to make a prediction OR
* Using a pencil spin the spinner to make a prediction

**Task 2 (Experimental and Theoretical Probability)**

Reflecting on the planning for your own day, predict what might happen in a day on an alien planet in a different part of the galaxy under the influence of a different sun.

How long might the day be?

Label the different sections of the spinner i.e. sleep, rest, recreation, work, food, family, bathing, etc.

Spin 150 times.

|  |  |  |  |
| --- | --- | --- | --- |
| Score | Tally | f | rf |
| Score 1 |  |  |  |
| Score 2 |  |  |  |
| Score 3 |  |  |  |
| Score 4 |  |  |  |
| Score 5 |  |  |  |
| Score 6 |  |  |  |
| Score 7 |  |  |  |
| Score 8 |  |  |  |
|  | Total |  |  |

If the spinner lands on a line, re-spin.

Are all the outcomes equally likely? Explain your answer.

What is the theoretical probability, in relation to your spinner, that the alien will be asleep?

Were your results expected? Explain your answer.

If you pooled your answers with the class would you expect the relative frequencies to change? Explain your answer.

Given your results, create a usual day in the life of an alien on this newly discovered planet and explain your reasoning.

**Task 3 (Compound events)**

Darth Jason wishes his offspring, Princess Chloe and Jedi Daniel, to communicate with the alien children to learn their language, customs and culture. Complete a table to outline how an “alien day” would compare to an “Earth Day”.