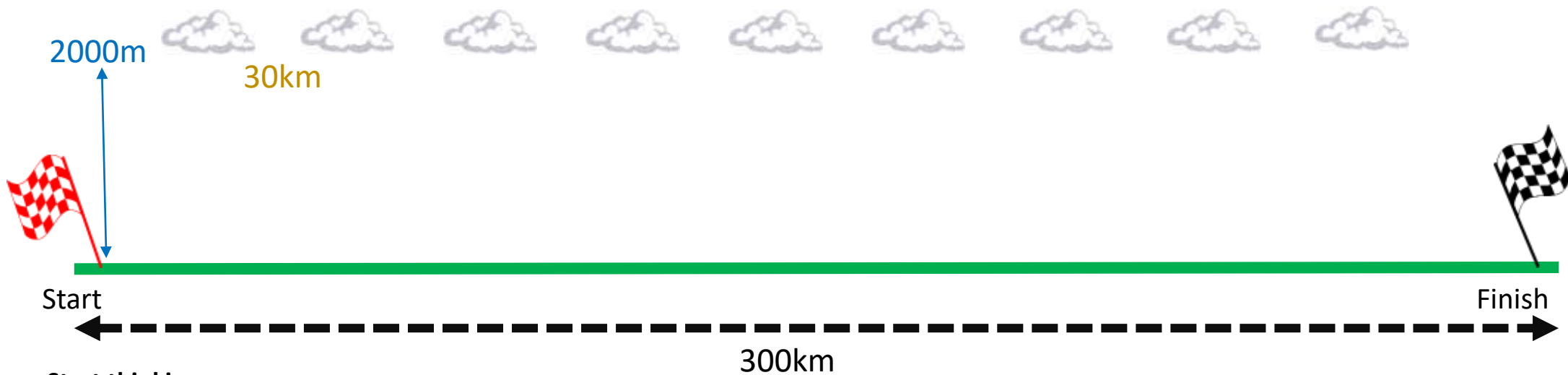


## Student Worksheet – Glider Racing Probability Challenge

**The challenge:** Complete a 300km course from start to finish in the quickest time using the most efficient technique.

**The course:** 300km from start to finish beneath 9 equally spaced clouds (each of which may or may not be an indicator of the presence of a thermal). The Met Office weather report says that the probability of lift being present at any cloud is 20%.

**The rules:** Your timer starts at 2000m overhead the start flag. You must stay at or below cloudbase which is 2000m.. Your glider has a glide ratio of 50:1 and you will fly at 100kph between thermals. If your glider reaches 500m in height at any time you must land immediately in a field below you.



### Start thinking...

- Can you complete the course if there is no lift under any of the clouds? Explain your answer.
- Assuming lift production by each cloud is **independent**, what is the probability of there being no lift under any of the clouds?
- If there are no thermals (i.e. none of the clouds has any lift under it) how far can your glider fly before you must land?
- What is the probability of **at least one** of the first two clouds producing lift?
- **How long** (in minutes) would it take you to climb 300m in lift of  $2\text{m/s}^{-1}$ ?
- Why would a competition glider pilot choose not to stop and thermal at every cloud?



## Breaking Weather News:

An area of high pressure has established itself over the UK bringing great thermal conditions.

You can expect to find lift at  $3\text{m/s}^{-1}$  under all clouds on your route.

### Time to fly!

Discuss and plan your route. How fast will you complete the course? Think about:

- How many times you will stop (if any)
- Where you will make those stops
- How high you will climb in the thermals. Are you climbing to cloudbase each time?
- Make sure you all understand the plan so you can feedback to the class.

Can you complete the course? Or are we coming to pick you up from a field with a trailer?

**Good luck!!**

*To experience this for real, find your nearest gliding club at [gliding.co.uk/club-finder/](http://gliding.co.uk/club-finder/)*

*Find out more about GLIDING at the links below, all types of AVIATION at [airleague.co.uk](http://airleague.co.uk) & CAREERS at [stem.caa.co.uk/careers-in-aviation-and-aerospace](http://stem.caa.co.uk/careers-in-aviation-and-aerospace)*

*We hope to see you on an airfield soon!*