Name .... Class .... Date ....

Mark Rogers – Facilities Manager
Mark helps to ensure the INEOS TEAM UK base is as energy efficient as possible.

Mark Rogers, the base's Facilities Manager, tracks the performance of the base's solar panels each day. The system automatically logs how much energy is produced (measured in kilowatt-hours, kWh) every hour. The data is shown below as a graph and as a table, for 1st October, 1st November and 1st December 2018.

Mark would like a report on the base's solar panel performance. Answer the questions below, and use your calculations/notes to summarise the data and suggest some things that he may want to consider to maximise the energy produced by the panels.

1 What is the mean output for each of the three days…

	1st Oct	1st Nov	1st Dec
…including hours when no energy is produced?			
…excluding hours when no energy is produced?			

Which of these means (with or without zero-production hours) do you think is best to use?

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2 What patterns and trends do you notice in the data?
How does the output vary……

a …throughout the day? Why? ....

b …between each day? Why? ....

[hint: use mathematical words to describe and compare the data, e.g. mean, median, range, distribution]
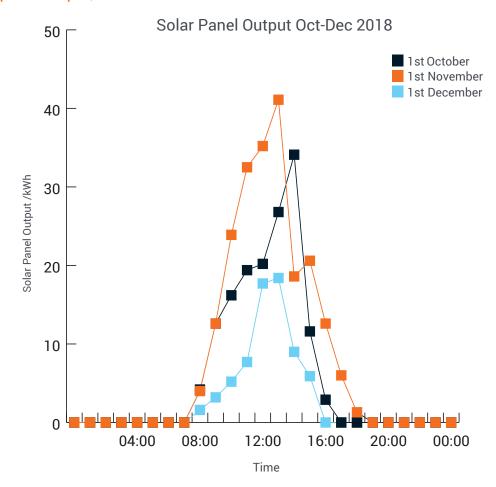
Did you know the INEOS TEAM UK base is powered by solar panels? The solar panels installed at INEOS TEAM UK have a capacity of 114 kW and contribute approximately 130,000 kWh of clean energy per year towards the team's energy needs – enough to power more than 40 homes – while saving over 60 tonnes of CO_2!

3 What factors might affect the solar panels' output? Consider as many as possible!

[hint: think about the base's location (Portsmouth, on the south coast of Great Britain), the calendar, the weather, the environment around the panels and the panels themselves]

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INEOS TEAM UK HQ
Solar panel output, October to December 2018

Hourly solar panel output /kWh			
Time	1st Oct	1st Nov	1st Dec
00:00	0.0	0.0	0.0
01:00	0.0	0.0	0.0
02:00	0.0	0.0	0.0
03:00	0.0	0.0	0.0
04:00	0.0	0.0	0.0
05:00	0.0	0.0	0.0
06:00	0.0	0.0	0.0
07:00	0.0	0.0	0.0
08:00	4.0	4.2	1.6
09:00	12.6	12.6	3.2
10:00	23.9	16.2	5.2
11:00	32.5	19.4	7.7
12:00	35.2	20.2	17.7
13:00	41.1	26.8	18.4
14:00	18.6	34.1	9.0
15:00	20.6	11.6	5.9
16:00	12.6	2.9	0.0
17:00	6.0	0.0	0.0
18:00	1.3	0.0	0.0
19:00	0.0	0.0	0.0
20:00	0.0	0.0	0.0
21:00	0.0	0.0	0.0
22:00	0.0	0.0	0.0
23:00	0.0	0.0	0.0

Solar Panel Output Oct-Dec 2018

Legend: 1st October, 1st November, 1st December