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| --- | --- | --- | --- |
| **Topic** | Precise, Accurate, Repeatable and Reproducible | **Level** | GCSE (or any course for students aged 11-16) |
| **Outcomes**  | To explain the difference between precise and accurateTo explain the difference between repeatable and reproducible.  |

**Has Daisy got a temperature?**



Farmer Nick had a beautiful cow called Daisy. One day Daisy felt rather hot. He wanted to measure Daisy’s temperature. He put a thermometer onto Daisy's skin and recorded the temperature. He repeated his measurement three more times using the same thermometer and recorded the temperatures below:

|  |  |
| --- | --- |
| **Reading number** | **Temperature (oC)**  |
| 1 | 35 |
| 2 | 37 |
| 3 | 36 |
| 4 | 36 |
| Mean | 36 |

1. **Was Nick accurate? Use the picture of Daisy to explain your answer.**

Farmer Jim's daughter, Amy, decided that a better way to take the temperature was to use a rectal thermometer.

|  |  |
| --- | --- |
| **Reading number** | **Temperature (oC) measured by Amy** |
| 1 | 42.0 |
| 2 | 37.0 |
| 3 | 39.0 |
| 4 | 36.0 |
| Mean | 38.5 |

1. **Was Amy accurate? Use the picture of Daisy to explain your answer.**

Here are the reading made by both farmer Nick and Amy.

|  |  |  |
| --- | --- | --- |
| **Reading number** | **Temperature (oC) measured by Nick** | **Temperature (oC) measured by Amy** |
| 1 | 35 | 42.0 |
| 2 | 37 | 37.0 |
| 3 | 36 | 39.0 |
| 4 | 36 | 36.0 |
| *Mean* | *36* | *38.5* |

Mark onto the thermometers the temperatures recorded by Nick and Amy.

**Farmer Nick’s readings Amy’s readings**





1. **Use the thermometers above to explain who collected the most precise results.**
2. **Did Nick and Amy get reproducible results? Explain your answer.**
3. **Did Nick or Amy get repeatable results? Explain your answer.**

**Progress:** further resources on working scientifically are available here:

<http://thescienceteacher.co.uk/how-science-works/>