A group of Year 11 Human Biology students decided to investigate the relationship between the height of an individual and their lung capacity in both males and females. 100 subjects (50 males and 50 females) of the same age group were selected and divided into height ranges. The Expiratory Reserve Volume (ERV), which is the amount of air that can be forcefully exhaled after a normal breath out, was obtained by breathing into a balloon, measuring the circumference and converting that measurement to millilitres. This was undertaken three times per participant and the average ERV for each height range was calculated.

The results of the experiment are shown in the table below.

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| **Height (cm)** |  | **156 - 160** | **161 – 165** | **166 - 170** |
| **ERV (mL)** | **Male** | 1213 | 1387 | 1393 |
| **Female** | 832 | 916 | 948 |

1. Identify the following variables for the students’ investigation:
   1. Independent. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Dependent. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Propose a hypothesis for which gender has the largest ERV.

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1. Describe **one** reason why increasing the height of an individual increases their ERV.

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1. As this investigation was conducted on humans, describe **two** ethical requirement that would need to be considered.

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1. State **one** change to this investigation that would increase the validity of the results.

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