

**Directions:** Answer the following question.

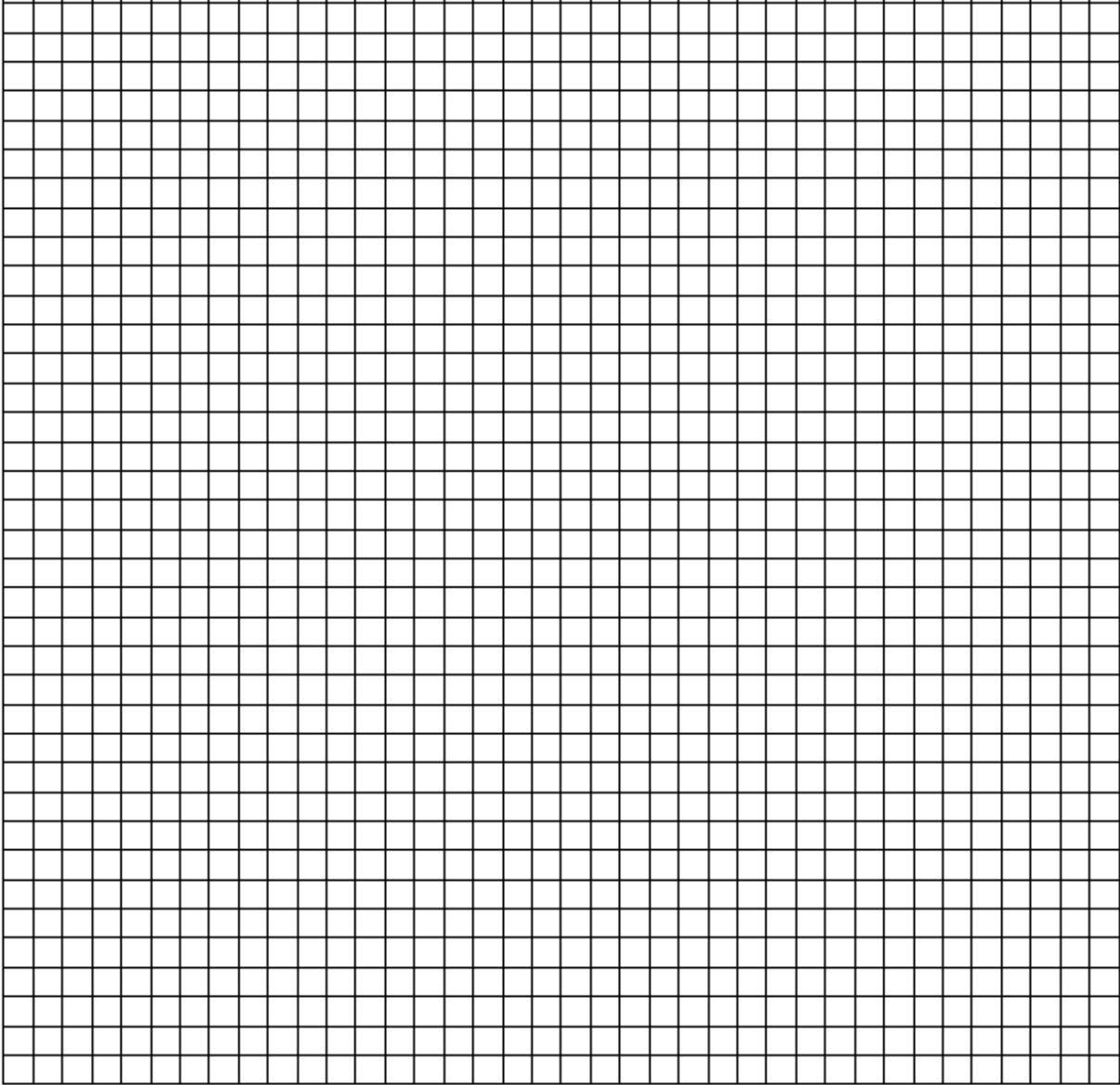
Answer must be in essay form. Outline form is not acceptable. Labeled diagrams may be used to supplement discussion, but in no case will a diagram alone suffice. It is important that you read the question completely before you begin to write. Write your answer on the lined pages that appear at the end of the question.

1. The results below are measurements of cumulative oxygen consumption by germinating and dry seeds. Gas volume measurements were corrected for changes in temperature and pressure.

Cumulative Oxygen Consumed (mL)

Time (minutes)	0	10	20	30	40
22° C Germinating Seeds	0.0	8.8	16.0	23.7	32.0
Dry Seeds	0.0	0.2	0.1	0.0	0.1
10° C Germinating Seeds	0.0	2.9	6.2	9.4	12.5
Dry Seeds	0.0	0.0	0.2	0.1	0.2

- Using the graph paper provided, plot the results for the germinating seeds at 22° C and at 10° C.
- Calculate the rate of oxygen consumption for the germinating seeds at 22° C, using the time interval between 10 and 20 minutes.
- Account for the differences in oxygen consumption observed between:
  - germinating seeds at 22° C and at 10° C;
  - germinating seeds and dry seeds.
- Describe the essential features of an experimental apparatus that could be used to measure oxygen consumption by a small organism. Explain why each of these features is necessary.



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