DIY Thermos Project

# Task

**Your task is to design and build a device to keep 100.0 mL of boiling water warm in the freezer for a 5 minute period. This device should also be able to protect 3 ice cubes from boiling water for a 1 minute period.**

# Rules

1. The device must be made from materials that have not been packaged into a commercially produced unit. You may use individual components from commercially produced units, but you cannot use more than one from a specific unit.

Example: No thermoses or travel mugs!

1. The dimensions for this will be 10.0 cm x 10.0 cm x 10.0 cm.
2. The device must be constructed by members of the group.
3. Maximum of 2 members in any group. You may work alone if you desire.

# Assessment

You will be marked on a report that **EACH individual produces** and hands in. Your report should include the:

1. **PURPOSE** of your device.
2. **THINKING** behind why your device is designed the way it was.
3. **DIAGRAM** of your device with the MATERIALS used.
4. **RESULTS** of your device in both cold water and boiling water.
5. **CALCULATION** of the heat absorbed by both the hot water and the ice cubes during the 5 minutes in the ice bath and boiling water respectively.
6. **STRENGTHS** of your device.
7. **IMPROVEMENTS** you would make to your device if building again.

Reports will be marked using the following rubric:

***RUBRIC Criteria***

* **Understanding of heat transfer**
* **Demonstration of how to calculate quantity of heat transferred**
* **Importance of materials**

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| --- | --- | --- | --- |
| ***1*** | ***2*** | ***3*** | ***4*** |
| Missing major elements of a 3. | Missing some minor elements of a 3. | Demonstrate a solid understanding of heat transfer, how to calculate quantity of heat transferred, and the importance of materials in heat transfer. | Exceeded the expectations of a 3. |

**NOTE: Your project assessment is NOT based on how ‘fancy’ the thermos looks OR how ‘fancy’ the write up looks. It IS marked on the depth of the criteria mentioned above!**