

# Murder on the Iditarod Trail

**Developed by:** Sid Lucas

**Discipline / Subject:** Life Science

**Topic:**

Blood Typing/Forensics/Immune Response

**Grade Level:**

9-12

**Resources / References / Materials Teacher Needs:**

1. Murder on the Trail Procedure document.
2. Synthetic blood stained cloth fragments.
3. Phenolphthalein/peroxide solution
4. Synthetic Blood (A+ and AB-) and corresponding Anti-serums (Anti-A, Anti-B, and Anti-Rh)
5. Blood testing trays
6. Colored toothpicks (3 colors)

**NOTE:** A kit with all of the necessary items can be purchased from Carolina Biological Supply for \$32.50 (as of January 23, 2013). Follow the link:

<http://www.carolina.com/forensic-blood-analysis/carolina-forensics-mystery-with-synthetic-blood-kit/700113.pr?catId=&mCat=&sCat=&ssCat=&question=blood+typing+forensics+kit>

**Lesson Summary:**

Students will investigate a simulated murder on the Iditarod trail by performing a blood typing test and applying their understanding of blood type and the human immune system.

**Standard's Addressed: (Local, State, or National)**

- 1) Use models to support explanations about the hierarchical organization of interacting systems working together to provide specific functions within multicellular organisms.
- 2) Formulate explanations using evidence.

**Learning Objectives:**

- 1) Students can simulate blood typing and identify specific blood types
- 2) Students can apply understanding of antigen/antibody reactions to determine blood type.
- 3) Students can analyze data to draw accurate conclusions.

**Assessment:**

Correct analysis of the data provided by this activity and accurate student conclusions will be evident in successful completion of the Murder on the Trail handout.

**Procedural Activities**

See *Murder on the Trail* handout.

**Materials Students Need:**

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**Technology Utilized to Enhance Learning:**

N/A

**Other Information:**

It will be helpful if students have an understanding of the basic concepts related to blood typing, including *antigens (agglutinogens)*, *antibodies (agglutinins)*, and *agglutination*, prior to performing this simulation. It is also helpful if students have some prior knowledge concerning the immune system and how it relates to blood type. This activity connects very well to the study of blood type genetics.

**Modifications for Special Learners/ Enrichment Opportunities**

Motivated students can obtain an authentic blood typing kit Online to use the skills learned in this activity to determine their personal blood type (Parental consent may be required).

It may be advantageous to supply special learners with a key that will allow him/her to interpret their blood typing results.