250H – Discussion

2/2/2026

Truth-Tellers and Liars Logic Puzzles

Most Common Setup:

- You're on an island where each inhabitant is a truth-teller (knight) or a liar (knave).
- We use knights and knaves since they are one syllabus
- Knights always tell the truth
- Knaves always lie
- You're given some information about some people
- You need to determine whether each person is a knight or a knave.
- In some cases, it may be impossible to determine what everyone is, or the situation may be impossible.

- In some problems, you will also have normals/randoms
  - These are people that can tell both truths and lies

Pokemon Example

Monferno tells the truth, but Infernape is a liar

Chimchar and Infernape are both liars

Both Chimchar and Monferno are liars

Pokemon Example 1

Monferno tells the truth, but Infernape is a liar

- Logic
  - Assume Chimchar tells the truth.
    - Monferno → Tells the truth
    - But Monferno says Chimchar is a liar → Contradiction!

Pokemon Example

Chimchar and Infernape are both liars

- Logic
  - Assume Chimchar tells the truth.
    - Monferno → Tells the truth
    - But Monferno says Chimchar is a liar → Contradiction!
  - Assume Monferno tells the truth
    - Chimchar → a liar
    - Infernape → a liar
    - But Chimchar's statement is true under these assumptions
      - Monferno → truth
      - Infernape → liar

Pokemon Example

Both Chimchar and Monferno are liars

- Logic
  - Assume Chimchar tells the truth.
    - Monferno → Tells the truth
    - But Monferno says Chimchar is a liar → Contradiction!
  - Assume Monferno tells the truth
    - Chimchar → a liar
    - Infernape → a liar
    - But Chimchar's statement is true under these assumptions
      - Monferno → truth
      - Infernape → liar
  - Infernape is telling the truth!
    - Chimchar → a liar
    - Monferno → a liar
    - All statements hold under this assumption

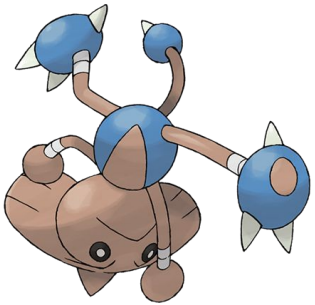
Pokemon Example 2

Hitmonchan is a liar, but Hitmonlee tells the truth

Hitmonlee is a liar, but Hitmontop tells the truth

Tyrogue tells the truth, but Hitmontop is a liar

Hitmonlee is a liar, but Tyrogue tells the truth



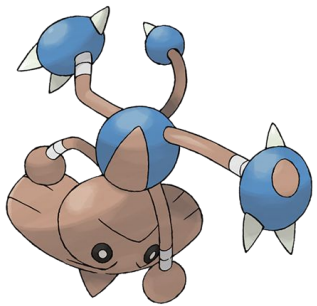
Pokemon Example 2

Hitmonlee is a liar, but Hitmontop tells the truth

- Logic
  - Assume Hitmonchan is telling the truth
    - Hitmonlee → liar
    - Hitmontop → truth
  - Check Hitmontop
    - Hitmonlee → liar
    - Tyrogue → truth
  - Check Tyrogue
    - Hitmonchan → liar
    - But Hitmontop is truthful and says Tyrogue is truthful
    - A contradiction!

Pokemon Example 2

Hitmonlee is a liar, but Tyrogue tells the truth



- Logic
  - Assume Hitmontop is telling the truth
    - Tyrogue → truth
    - Hitmonlee → liar
  - Check Tyrogue
    - Hitmonchan → liar
    - Hitmonlee → truth
    - Contradiction!

Pokemon Example 2

Hitmonchan is a liar, but Hitmonlee tells the truth

- Logic
  - All of Tyrogue's statements hold!
  - Tyrogue says Hitmonlee is trustworthy, so he tells the truth too