1. If Teddy wins his frisbee game, he comes home in a good mood. Today, Teddy came home in a good mood. Is it necessarily true that Teddy won his frisbee game? Find a volunteer and explain to them why or why not.

2. A teacher tells his class “All zebras have stripes.” Tom says, “If an animal has stripes, then it has to be a zebra.” Jonathan says, “If an animal doesn’t have stripes, it definitely isn’t a zebra.” Find a volunteer and explain who is right (if anyone is) and who is wrong (if anyone is) and why.

3. Richard’s dog Ernie always sneezes on the day before a rainstorm. Today, Ernie sneezed. Richard says, “Since my dog is sneezing, there will be a rainstorm tomorrow.” Is Richard’s conclusion correct? Is it necessarily going to rain tomorrow? Find a volunteer and explain to them why or why not.

4. On an island far away lives two types of people--people who always tell the truth, who we will call *truthers,* and people who always tell lies, who we will call *liars.* If a liar with a marble in his pocket comes up to you and says “The marble in my pocket is black,” do we know what color the marble has to be? If the liar goes into a room and says “there is no one wearing a purple hat in this room,” what can you say about the number of people wearing purple hats in the room?

5. On the island there are also *tourists*, who sometimes tell the truth and sometimes lie (and we can’t tell when they are lying and when they are telling the truth--ask a volunteer if this isn’t clear!). Suppose you meet a person on the street who says “I am a liar.” Are they a truther, a liar, or a tourist? Find a volunteer and explain how you know.

6. Suppose you meet two people that you know live on the island named Jonathan and Allie (meaning neither of them are tourists). Allie comes up to you and says “At least one of us is a liar.” Determine which group (truther or liar) that Jonathan and Allie belong to, and find a volunteer and explain how you know.

7. While visiting the island, you meet a group of three people who all live on the island named The Other Joe, Joe, and Hannah. You ask each of them the same question: “How many truthers are in your group?” The Other Joe replies, “None.” Joe replies “One.” Can you find out if Hannah is a truther or a liar? What will her response be when you ask how many truthers are in the group?

8. When visiting the island, you find a frisbee field where you meet three islanders (meaning truthers or liars) named Jackson, Rok, and Colin. You ask Jackson, “Are you a truther or a liar?” However, you can’t hear Jackson’s answer. So you ask Rok, “What did Jackson say?” and Rok answers “He said that he is a liar.” Colin yells: “Don’t trust Rok! Rok is a liar!” Can you decide whether Rok and Colin are truthers or liars?

9. Ceren, Natalie, Neža, and Tom all live on the island. Ceren claims that Natalie is a liar. Tom states that Ceren is a liar. Neža declares that both Ceren and Natalie are liars. Neža also states that Tom is a liar as well. Who is what? Find a volunteer and explain who is who.

10. (Singaporian Birthday Problem) Albert and Bernard just met Cheryl. “When is your birthday?” Albert asked Cheryl. Cheryl thought for a second and said “I’m not going to tell you, but I’ll give you some clues!” said that her birthday was one of the dates on this list:

    May 15, May 16, May 19,
    June 17, June 18,
    July 14, July 16,
    August 14, August 15, August 17

Then Cheryl whispered in Albert’s ear the month (and only the month) of her birthday. To Bernard, she whispered the day (and only the day). “Can you figure it out now?” she asked Albert.

Albert: I don’t know when your birthday is, but I know Bernard doesn’t know, either.

Bernard: I didn’t know originally, but now I know.

Albert: Well, now I know too!

When is Cheryl’s birthday?

11. You’re treasure hunting on the island and you find two doors guarded by two people that you know live on the island. You know one of them is a truther and one of them is a liar. They are each guarding one door--one of which has treasure behind is and one of them has a person eating tiger. The problem is, you don’t know who is guarding what door! You pick one of the people at random (and you don’t know whether they’re the liar or truther). What’s a question you can ask to figure out which door has the treasure?

12. You meet three people on the island. You know one is a tourist, one is a liar, and one is a truther, but you don’t know who is who! You pick someone at random and get to ask one (and only one) question. What one question can you ask if your goal is to find someone who lives on the island? (Note: You don’t have to know if they’re a liar or truther. Recall that tourists might lie and might tell the truth, and you never know which they’re doing!)

13. (Hat Puzzle) A guard plays a game with prisoners in a prison. Each prisoner is assigned a random hat, either red or blue, but the number of each color hat is not known to the prisoners. The prisoners will be lined up single file where each can see the hats in front of him but not behind. Starting with the prisoner in the back of the line and moving forward, they must each, in turn, say only one word which must be "red" or "blue". If the word matches their hat color they are released, if not, they are killed on the spot. A sympathetic guard warns them of this test one hour beforehand and tells them that they can formulate a plan where by following the stated rules, 9 of the 10 prisoners will definitely survive, and 1 has a 50/50 chance of survival. What is the plan?

14. One hundred logicians have their foreheads painted, each either blue or not-blue, and are led into a room. (e.g. there could be 1 blue, 99 non-blue; 44 blue, 56 non-blue; 88 blue, 12 non-blue, etc.) They are told that at least one person in the room has a blue forehead.

*The logicians are allowed to look around the room at each other (noting the color of everyone's forehead, except their own, of course), but are not allowed to *talk* to one another. After 1 minute, the logicians are told "Anyone who is *certain* their forehead is blue must now leave the room".

The game is repeated, meaning the logicians are told that anyone who is certain their forehead is blue must leave. The game is repeated again, and again, and so on. What happens if all 100 logicians have their foreheads painted blue? (*Please* find a volunteer if you’re stuck on this or the question is unclear!)