

Interstellar Mission

Script

Prologue: The Mission

Topics Addressed: N/A

Parent: **BOSS**

Student: **CAPTAIN**

The Captain, who works for the Riddle-Me-This Space Company, is sitting at home on a lazy Sunday afternoon watching TV when he gets a call from the Boss.

CAPTAIN: Boss?

BOSS: Hello, Captain.

CAPTAIN: Is everything OK?

BOSS: No, Captain. We have an intergalactic emergency on our hands.

CAPTAIN: What kind of emergency?

BOSS: No time to explain. I need you to meet me at the headquarters ASAP.

CAPTAIN: Will do, Boss. I'm on my way.

The Captain sprints to the headquarters as fast as he can, where he finds the Boss staring intensely at his computer screen.

CAPTAIN: Boss! It's me, the Captain. I came here as fast as I could. What's the emergency? Is a massive meteor plummeting towards Earth? Are cruel aliens plotting an attack against humanity?

BOSS: No. What we're dealing with is far more serious.

CAPTAIN: Please, tell me!

BOSS: Well, you see, our alien research squadron has recently made a new, groundbreaking discovery regarding extraterrestrial life on a faraway planet known as S-01UT10n.

The Boss turns around his computer to reveal a picture of a chubby, harmless-looking alien.

CAPTAIN: Oh my gosh, it's so cute!

BOSS: Yes, and that's exactly the problem. My daughter got her hands on this picture, and now all she talks about is how much she wants one of these aliens to be her pet. So I am asking you to go to S-01UT10n and fetch an alien for my daughter, so that maybe, just maybe, she'll finally leave me alone.

CAPTAIN: So this is the "intergalactic emergency" that interrupted my relaxing Sunday afternoon?

BOSS: Trust me, Captain. If you lived with my daughter, you would understand the kind of havoc she can wreak. So, are you in?

CAPTAIN: Of course, boss. Whatever you say.

BOSS: Excellent! Oh, and one other thing: these aliens might look cute, but they are anything but. They are vicious, cruel, and will eat humans for lunch. Not to mention they are just as intelligent as us humans. The only way you will be able to capture one is by outsmarting it.

CAPTAIN: I don't know if I can do this, Boss. I have an uneasy feeling.

BOSS: I have faith in you, Captain. If I didn't, I wouldn't be sending you on this mission. Now, go! The rocket is waiting for you at the launchpad. Good luck!

END OF SCENE

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Chapter 1: Prepare for Takeoff

Topics Addressed: Unit Conversions, Surface Area & Volume, Basic Geometry

Parent: **ENGINEER**

Student: **CAPTAIN**

The Captain arrives at the launchpad and finds that the Engineer is still working on the rocket.

CAPTAIN: What happened? I thought the rocket was going to be ready?

ENGINEER: Yes, well...uh...you see, I'm having a little difficulty with some of the calculations.

CAPTAIN: You're an engineer. Isn't making calculations your job? It can't be that hard. It's not rocket science!

ENGINEER: Well, actually, it *is* rocket science. And no, I'm not an engineer. The Engineer is on vacation in Florida right now, so the Boss hired me off the street to deal with this last-minute emergency.

CAPTAIN: I don't know how I feel about an untrained engineer building a rocket that I'm supposed to travel across space in...

ENGINEER: Hey, I have an idea! Why don't you help me with the calculations? Then you can be sure the rocket is built to perfection.

CAPTAIN: I don't know. I've never been the best at math.

ENGINEER: Come on, I know you can do it! I'm sure you're at least better at math than me!

CAPTAIN: That is not exactly what I want to be hearing from the person designing my rocket...

ENGINEER: So is that a yes?

CAPTAIN: OK. I'll do it.

ENGINEER: Great! I knew I could count on you! So, the first thing I need you to calculate is the amount of fuel I need to pump into the rocket. Planet S-01UT10n is 100,000 light years away. But remember, you'll need enough fuel to make it back to Earth too! We've got some top-notch fuel on hand—1 liter will go for 5 light years. Now, tell me, how many liters of fuel will the rocket need to get all the way to S-01UT10n and back?

The Captain works out the solution. (Solution is listed in Answer Key.)

ENGINEER: Nice work! The next thing I need you to calculate is the total cost of the rocket. It's going to weigh 150 tons, and steel costs \$2 per pound. Remember that one ton is equal to 2,000 pounds. However, the rocket is only going to be 60% steel by mass, and I've already figured out that the rest of the materials will cost a total of \$100,000. Boss has given me a budget of \$500,000 to spend on the rocket, so I need to make sure it costs less than that—otherwise, I'm going to have to redesign the whole thing. Tell me, is the total cost of the rocket more or less than \$500,000?

The Captain works out the exact cost of the rocket and compares it to the \$500,000 budget. (Solution is listed in Answer Key.)

CAPTAIN: You should be under budget.

ENGINEER: Phew! Okay, onto your final calculation. In order to protect your rocket from powerful cosmic rays, I'm going to need to apply a layer of radiation-proof paint. I need you to tell me how many 1-liter cans of paint are enough to cover the whole rocket in a 0.002-meter thick coating. The rocket is a rectangular prism with side lengths 30 meters by 10 meters by 10 meters. It might be helpful to draw a picture. Oh, and one more thing—you should know that there are 1000 liters in 1 cubic meter.

The Captain works out the solution. (Solution is listed in Answer Key.)

ENGINEER: Wow, thanks for all of your help, Captain! I should be good to go. Just wait a little while and your rocket will be all ready for takeoff!

There is a pause for about five seconds.

ENGINEER: All right! She's all ready to go!

CAPTAIN: Wow, that was fast. It's almost like you never even left my sight.

ENGINEER: Ha-ha. Very funny, Captain. So, I think it's about time you head aboard your rocket. Your crew is waiting for you. And thanks again for the assistance.

CAPTAIN: No problem.

The Captain mimes boarding the rocket..

CAPTAIN & ENGINEER: Three! Two! One! Blast off!

END OF SCENE

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Chapter 2: Drifting Through Space

Topics Addressed: Order of Operations

Parent: **FIRST MATE**

Student: **CAPTAIN**

The Captain and his First Mate are sitting in the cockpit as the rocket drifts through empty space.

CAPTAIN: We sure have been flying for a long time. How close are we to S-01UT10n?

FIRST MATE: It seems we still have a long way to go. If we make good time, we can reach the planet's outer atmosphere in about 24 more hours.

CAPTAIN: What? You've got to be kidding me. How long since we took off?

FIRST MATE: About 45 minutes.

CAPTAIN: Ugh. 24 more hours! Hey, that reminds me, have you ever heard of the game 24?

FIRST MATE: No, what's that?

CAPTAIN: You give me four integers, and I have to write an expression that combines all four of them using addition, subtraction, multiplication, division, and parentheses to get a result of 24.

FIRST MATE: Oooh, that sounds like fun! And it will help pass the time, too!

CAPTAIN: You're right, it will! OK, go ahead and give me four numbers, any numbers.

FIRST MATE: How about: 1, 2, 5, and 5.

The Captain responds with a solution. (There are many possible solutions, all of which can be verified using a calculator, but make sure to keep in mind order of operations. The Answer Key lists some possible solutions.)

FIRST MATE: Way to go! Now try: 4, 10, 11, and 12.

The Captain responds with a correct solution. (See Answer Key for possible solutions.)

CAPTAIN: Whew, that was a tough one. How far are we from S-01UT10n?

FIRST MATE: About 12 more hours.

CAPTAIN: 12 hours? WHAT? It feels like just minutes ago when you said we had 24 more hours!

FIRST MATE: Time flies when you're having fun!

CAPTAIN: Wow, I didn't realize math was so fun that it could make 12 hours feel like 10 minutes. Keep going! I want to get there as soon as possible! Come on, do your worst!

FIRST MATE: Alright, here you go: 2, 2, 9, and 10.

The Captain responds with a correct solution. (See Answer Key for possible solutions.)

FIRST MATE: We're almost there! One more problem and that should do it. Okay, here we go: 1, 4, 5, and 6.

The Captain responds with a correct solution. (See Answer Key for possible solutions.)

FIRST MATE: And with that, we've arrived!

CAPTAIN: Thanks, Mate. You really helped make the time go by.

FIRST MATE: No problem, Captain. Now, get ready, because the cockpit is about to detach from the body of the rocket and enter the atmosphere. It's going to be a bumpy ride! Three, two, one, here we go!

CAPTAIN: Whoa!

The cockpit crashes onto the surface of S-01UT10n with a loud "thud."

FIRST MATE: Okay, Captain. You go out there and fetch the Boss an alien. I'll stay back and keep watch here. Good luck!

END OF SCENE

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Chapter 3: Kidnapped!

Topics Addressed: Chinese Remainder Theorem, Parity

Parent: **ALIEN**

Student: **CAPTAIN**

The Captain is standing in the middle of nowhere, consulting his map to decide which direction to go.

CAPTAIN: Let's see...the rocket is back that way, and I've already explored over there to the north. There's got to be aliens around here somewhere! Maybe if I—

An Alien appears.

ALIEN: Lost, are we?

CAPTAIN: Who said that?

The Captain turns around to see the Alien.

ALIEN: Why, hello, Earthling. To what do I owe the pleasure of your company?

CAPTAIN: Ha, an alien! Finally! I've come to take you back to Earth!

ALIEN: Of what use could I possibly be to you on Earth?

CAPTAIN: Well, my Boss's daughter saw a picture of one of your kind, and she just finds you so irresistibly cute that she wants one of you as a pet.

ALIEN: Cute? CUTE? Hogwash! I am not cute! I am vicious, terrifying, and evil!

The Captain chuckles.

ALIEN: Are you..mocking me? How offensive! I'll strike you with terror with my monstrous roar!

The Alien lets out a squeaky, subdued roar. The Captain is unfazed.

ALIEN: Perhaps you have a point. Nevertheless, although I may be cute in appearance, I will tell you this: you have trifled with the wrong alien! Gwa ha ha ha ha!

A net falls from the sky and traps the Captain.

CAPTAIN: Let me go!

ALIEN: Never! You are under my control, and I shall decide your fate!

CAPTAIN: And what are you going to do to me?

ALIEN: I shall devour you!

CAPTAIN: No!

ALIEN: Oh, yes! You will make a most succulent lunch!

CAPTAIN: Hear me out, Alien. I can see how intelligent you are. To simply capture and eat me would be brutish and uncivilized.

ALIEN: I suppose you are right. Us aliens are a logical, rational species, after all.

CAPTAIN: Yes, exactly! It is in your nature to free me!

ALIEN: Ha! Not so fast. It is *also* in my nature to consume Earthling invaders like yourself. But I have an idea. A sort of compromise, if you will. You will be presented with a riddle. *(The Alien takes out a deck of cards.)* Here is a deck of cards. *(Behind his back, the Alien removes the top cards of the deck that constitute the solution to the riddle.)* I will now remove some cards from the deck and set them aside. *(The Alien hides both the removed cards and the remaining deck out of the Captain's sight.)* Your task is to decipher how many cards, and which cards, I removed from the deck, without looking at the remaining cards. If you guess correctly, you will be spared, and I will let you take me back to Earth as your boss's daughter's pet. If not, you will become my next meal!

CAPTAIN: But that's not fair! There are 52 cards in a deck, and it could be any of them. The odds are clearly in your favor.

ALIEN: Of course, I will provide you with a few necessary hints. *(The Alien hands the Captain a note containing the hints.)* If you possess sufficient wit and intellect, you will be able to solve this riddle. But I highly doubt your pathetic little Earthling mind is capable of doing so. Now, go and figure out how you plan on avoiding your inevitable death. Tick tock, your time is running out?

The Captain unfolds the note and reads it out loud.

CAPTAIN: "A certain number of cards have been removed from a standard 52-card deck. At least one card has been removed. If the remaining cards in the deck were dealt to 3 people such that each person were to get an equal number of cards, 1 card would be remaining. If they were dealt to 5 people in this

manner, 4 cards would remain. 7 people, and no cards would remain. Now, assign each card a value, with aces being 1, twos being 2, threes being 3, and so on, until the three face cards: jacks, queens, and kings. Jacks are worth 11, queens 12, and kings 13. Out of the cards removed from the deck, no two have the same value. There is one and only one face card, and the rest of the cards have back-to-back values (for example, 2 and 3, or 7, 8, 9, and 10). The values of all the cards add up to 27. Of these cards, the highest-valued one is a heart, the second-highest (if it exists) is a spade, the third-highest (if it exists) a heart, the fourth-highest (if it exists) a spade, and so on. What cards have been removed from the deck?"
Alright, time to get to work.

CAPTAIN: I've solved the riddle.

ALIEN: Oh, have you? Let's see what boneheaded answer your Earthling brain has come up with.

The Captain provides the correct answer. (Solution is listed in Answer Key.)

ALIEN: No...no...how can this be? That's the correct answer!

CAPTAIN: Yes! Now take me out of this trap! *(The Alien removes the net from the Captain.)*

ALIEN: Oh, well. I am an alien of my word. *(The Captain tosses the net onto the Alien.)* You may take me back to your planet.

The Captain's cell phone rings. It's the Boss. He picks it up and holds it to his ear.

CAPTAIN: *(talking into the phone)* Boss? *(pause)* What? *(pause)* Your daughter's friends saw the alien? *(pause)* They want their own? *(pause)* I have to get two more aliens? *(pause)* No, I've only found one. *(pause)* I don't want to die!

The Boss hangs up. The Captain puts his phone away.

CAPTAIN: *(to the Alien)* Any chance you know where I can find some more aliens?

ALIEN: Yes! If I should fall, all civilization on this planet shall fall with me! Follow me, Earthling. It is finally time to execute my diabolical plan to enslave the alien race!

CAPTAIN: I just need two.

ALIEN: Oh. Well, I suppose we can simply capture a couple.

CAPTAIN: Thank you, Alien. Lead the way.

They exit.

END OF SCENE

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Chapter 4: The Return

Topics Addressed: Logical Reasoning

Parent: **FIRST MATE**

Student: **CAPTAIN**

The Captain returns to the cockpit with three aliens in tow, under a net. The First Mate is pacing nervously.

CAPTAIN: Hey, Mate! I got the alien, and two more for good measure!

FIRST MATE: Captain, we have a serious issue. The body of the rocket hasn't landed yet. I don't know where it is. We can't leave until—

CAPTAIN: Duck!

FIRST MATE: Where?

CAPTAIN: No! Duck! Get on the ground and cover your head!

The Captain and First Mate duck down to the ground. The body of the rocket, engulfed in flames, crashes nearby into the planet's surface.

FIRST MATE: It's destroyed!

CAPTAIN: We're stuck here forever! We're as good as alien food!

FIRST MATE: Wait—I have an idea. The cockpit can fit the two of us, right?

CAPTAIN: Right, but it can't fly anywhere because all of the gas was stored in the body of the rocket.

FIRST MATE: Unless...

CAPTAIN: Unless what?

FIRST MATE: Unless your trusty First Mate brought an extra gas tank because he just knew something like this was going to happen!

CAPTAIN: Did you really?

FIRST MATE: You bet I did!

The First Mate pulls out the gas tank.

CAPTAIN: You're the best, Mate!

FIRST MATE: Thank you, Captain. Now, let me attach this tank, and then we'll hop aboard and head for Earth.

CAPTAIN: But wait, isn't there any way we can bring the aliens along with us?

FIRST MATE: The weight capacity in the cockpit only allows for two creatures to be aboard at a time. However...maybe if we were to take multiple trips...

CAPTAIN: Yes! The only problem is that when we take the net off of the aliens, if they outnumber us either here or back on Earth, they'll surely eat us.

FIRST MATE: Not to worry! The rocket came equipped with a robotic second mate. I can take it out of the cockpit and it should fool the aliens into thinking it's a human.

CAPTAIN: GENIUS!

FIRST MATE: Still, we're going to have to figure out a way to travel back two at a time such that the three aliens never outnumber the three humans (well, two humans and one robot) either here on S-01UT10n or on Earth, including while the cockpit is unloading. One creature is always going to have to be in the cockpit to fly it, so it's likely that all of us will go back and forth multiple times.

CAPTAIN: This sounds like a logic problem. Why don't I give it a whirl while you attach the gas tank?

FIRST MATE: Sounds good, Captain. According to my computer here, it shouldn't take us more than eleven trips across space to get all six of us back to Earth. Now, it's up to you to figure out the exact sequence. Good luck.

The First Mate goes to work attaching the gas tank. When he comes back, the Captain is ready with a solution. (Solution is listed in Answer Key.)

FIRST MATE: All assembled. Did you figure out how we're going to get back to Earth?

The Captain provides a correct solution. There are several possibilities, which can be verified using different-colored blocks or some other object to represent the aliens and humans. One possible solution is shown in the answer key.

FIRST MATE: Yep, it looks like this sequence should work. Great work, Captain! Now, let's load up the first crew and start the process of heading home.

END OF SCENE

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Epilogue: Home at Last

Topics Addressed: N/A

Parent: **BOSS**

Student: **CAPTAIN**

The Captain returns to the headquarters after returning to Earth safely with the First Mate, the three aliens, and the dummy pilot.

BOSS: Captain! You made it!

CAPTAIN: Yes, Boss. I'm home at last.

BOSS: Do tell me you have the three aliens with you?

CAPTAIN: I do.

The Captain shows the Boss a photograph of the aliens.

BOSS: Oh, wonderful! If you don't mind, I'm going to call my daughter right now to let her know the good news.

The Boss takes out his phone and dials his daughter.

BOSS: *(talking into the phone)* Hi, honey. *(pause)* No, you're not in trouble. *(pause)* I got the alien. *(An audible shriek is heard from the phone. This can be voiced by either the Captain or the Boss.)* Yes, I got them for your friends too. *(pause)* They're just as cute as in the picture. *(pause)* Well, I'm glad you're happy. *(pause)* I love you too.

The Boss hangs up and puts his phone away.

BOSS: Way to go, Captain. You've made my daughter very happy.

CAPTAIN: Thanks, Boss. It wasn't easy—I really had to use my brain—but in the end, I got it done.

BOSS: What did I tell you? I knew you were up for the task. You're a lot smarter than you realize, kid.

CAPTAIN: Well, now I feel a lot more confident in my math and problem solving skills. They really came in handy.

BOSS: I'm sure they did. Thanks again, Captain. Next time I need someone with a quick wit and a sharp mind to solve an intergalactic emergency, I'll know exactly who to call.

CAPTAIN: And I'll know exactly where to find you. Goodbye, Boss. Enjoy your new pet alien.

BOSS: I'll try, Captain. I can't imagine it will be anywhere near as difficult to manage as my daughter.

CAPTAIN: *(remembering his prior experiences with the alien)* You might be in for a rude awakening.

They both laugh.

END OF SCENE