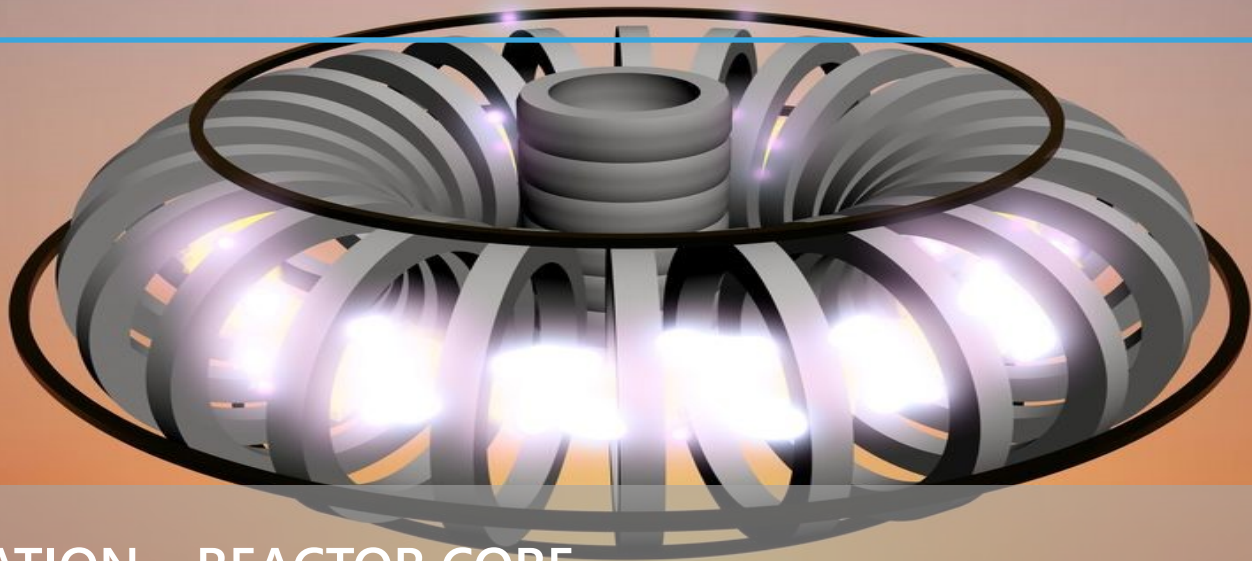


MATH ADVENTURE KIT

Star Base Alpha

Script &
Station Details
for the
Reactor Core



STATION – REACTOR CORE

CHARACTERS

Receptionist – Greets teams outside; controls traffic flow

Maintenance Engineer – Guides teams through the challenge

Departure – Makes sure exiting teams have everything they need

BACK STORY

The star base's core power source, its fusion reactor, has had an accident. The fuel rods have all been knocked down. Now the base is running on backup batteries, so it is urgent that the team get things put back together.

When correctly aligned, the fuel rods form a pyramid. They are not safe to touch by hand. Instead, students will need to use robot claw arms, which require substantially more dexterity.

It doesn't really matter how big the pyramid challenge is. It should be wide enough that all the students can work together. But it shouldn't be so tall that shorter students can't reach the top rows. Consider challenging older kids to start with a base of 6, and go 6 levels up. Middle grades can go for 5 and 5. While the youngest grades go 4 and 4. If you want to make it easier, place the work table against a wall. Teams find it easier to stack the cups against the wall.

LOCATION

A school classroom, or an open space with large work tables.

This is a station where multiple teams can comfortably work next to each other. There is no story surprise to spoil, so they just need enough elbow room to be able to all get their work done. It is likely to be high energy, and thus noisy, but that can be part of the fun.

The receptionist and departure helper stay in the hallway. They support all teams in the room.



STATION – REACTOR CORE

SCRIPT

Receptionist: Hello, thank goodness you're here! We're having a rough day. What's your team name?

Team: (Name)

Receptionist: *(Confirm team has solved the correct puzzle for this station, and has a reasonable answer)*
You'll need to talk to the engineer. He can fill you in on what's happened.

Engineer: Hello! You must be the fresh meat, I mean, the new recruits that just arrived! Forget I said that. Fresh meat is sort of a private in-joke. Anyway, there has been a little accident. Someone, and we don't need to go into details about who it was and start all the finger pointing, anyway, they backed the forklift into the reactor core.

We need to re-assemble the fuel rods! Quick question. Is anyone here allergic to radiation? No reason. Just curious. I have these energy bands. I figured you might want them. They're supposed to reduce your chance of getting sunburned. I don't know if they really work, but at least you'll look cool.

(hand each student a glow-stick bracelet or necklace)

Beyond that, I'm afraid I slept through the safety training. Do you have any ideas?

Team: **Robot Arm!**

Engineer: Good idea!

Probably best that you don't touch the fuel rods with your hands. Your glowy necklace would definitely not protect you, and your hand might mutate into who knows what!

Use these robot claw arms to carefully rebuild the fuel rods into a pyramid. It looks like the bottom row holds 6. That means five on the second row, and so on.

And, I hate to add any more stress to this situation, but the whole base is running on batteries until we get this fixed, so, um, good luck!

(hand each student a robot grabber claw)

You can keep the energy bands when we're done, but I'll need the robot arms back afterwards, just in case there are any more accidents.

Team: *(spread out, around the table, so everyone can reach the cups, and the growing pyramid).*

(work together to pick up cups, and arrange them in a neat row).

(occasionally, cups will fall on the floor. Ideally, they should be picked up with the robot arm, but it's not really critical—especially if a team is struggling)

Engineer: *(once the pyramid is complete)*

You did it! You're restored power to the base. It's as if that little accident never happened, right?

Team: *(places robot arms on table, and follows the engineer out of the room)*



STATION – REACTOR CORE

SCRIPT (CONTINUED)

- Departure:** Bravo team, you got the reactor back online!
Make sure you leave your robot arms here.
- A message came from the Commander while you were working. We've made contact with an advanced alien race, but we're having trouble communicating with them. Have you been to the Trading Post yet?
- Team:** *answers **yes** if their first puzzle was the Trading Post. Otherwise, they answer **no**.*
- Departure:** (If no...) Well then, you'll need this packet.
(*hands them their next puzzle*).
Good luck!
- (If yes, they've already done the Trading Post...) Then you're done!
Go find the Base Commander!

ROOM RESET

- Engineer:** *Take down the pyramid of cups, and spread them out on the table. Half can be upside-down (ready for stacking), and the other half can be right-side-up (needing to be turned over to stack). Don't leave them in a single tube stack—those are too hard to separate.*
- Make sure you have glow-stick necklaces/bracelets assembled for the next team.*

INCOMING PUZZLE

Before arriving at this station, each team will solve a math puzzle in the form of a dot-to-dot.

The instructions tell them "Oops! There's been a small accident in the power plant. Solve the puzzle to figure out how it can be fixed."

Their answer will be something along the lines of "CUP STACK" or "ROBOT ARM".

DEPARTURE

As teams leave, they should have 2 things:

- The glow-stick necklace or bracelets
- The outgoing puzzle – **Trading Post**
- ⊗ They should NOT take the robot arms with them.



STATION – REACTOR CORE

SUPPLY LIST

- Stacks of stackable plastic cups. Can be anywhere from 8oz to 16oz (250-500ml). Smaller cups are easier to hold with the robot arms.
Have at least 25 cups per team that will play concurrently. It's helpful to get different colors for each table, so that cups on the floor can easily be returned to their homes.
- At least 5 robot arms, times the number of teams that might play concurrently. Make sure to get the pincer style, and not the ones that are made to look like human hands.
- A bulk supply of glow-stick necklaces. One per student, with plenty of spares for creative decorating, or little siblings that come along for the ride.
- Outgoing puzzle – **Trading Post**
- Hallway signs saying – **Reactor Core**
- Masking tape – for signs
- Thick black marker – for drawing arrows on signs
- Team list – listing each team, and their level expected level
- Pencil – to check teams off as they arrive
- Water – actors talk a lot, and get thirsty

COSTUME SUGGESTIONS

The receptionist and departure helper can wear whatever they like.

The engineer could dress up in clothes that look appropriate for a machine shop—overalls or the like.



STATION – REACTOR CORE

STATION SETUP

- Take a picture with your cell phone of both the classroom area you intend to use, and the hallway outside. This will help you return any moved furniture back where you found it.
- Pick one or more tables for teams to stack cups on. Make sure these tables are cleared off, and are placed where there's good access from all sides. (If you move tables, make sure you know where to move them back to!)
- If convenient, place one table again a wall. Younger teams that struggle with the dexterity will find it much harder if they can construct their pyramid against a wall.
- Spread 20-25 cups around each table. Roughly half right-side-up, and half upside-down.
- Place 4 robot arms on each table. Spare arms should go on a side table, where kids aren't likely to grab them. These are for the occasional team of 5 that shows up.
- Assemble enough glow-stick necklaces or bracelets for the first several teams. Set the supplies for the remaining teams off to one side. You can assemble these in the gaps between teams.
- Place a reception table in the hall, at least 10 feet from the classroom door.
- Place the supply of outgoing puzzles on the table, along with the team list.
- Hang up signs
 - Tape one of the hallway signs to the front of the reception table, or on a wall above it, so arriving teams know they're in the right place.
 - Tape the remaining signs along the route from the solving area to this station. Use a black marker to add arrows for direction.
 - The first sign should be inside the solving area, at the exit, where teams inside can see it.
 - Where logical, group with other station signs for easier visibility.
 - There's no need to mark the classrooms themselves. The whole purpose of the signs is to help teams find their way from the solving area to your reception table.



STATION – REACTOR CORE

LAYOUT TIPS

Make sure the reception table is the first thing incoming teams will see.

Leave a sizable buffer between the reception table and the classrooms. At least 10 feet, but farther is better. This way, teams waiting outside won't crowd the actors, who can then talk to one team at a time outside the station room. Also, this means that teams that spill out of the room giggling won't immediately run into the next team in line.

Try to block the view of the station activity from teams waiting in line, so as not to spoil any surprises.

If you have room, and enough staff for separate receptionist and departure helpers, give them each their own desk, and create a loop route for teams to go through. The receptionist table gets the tame list. The departure table is closer to the classroom, and gets the outgoing puzzles. However, if you are understaffed, the receptionist and departure assistant jobs can be merged into one person at one desk.

TEAM MANAGEMENT AND PARALLEL ROOMS

In order for the evening to flow smoothly, you will want each team to complete their experience at this station in 4-5 minutes. If you have extra cups and robot arms, it's easy to set up a spare table for the occasional rush of teams. In a pinch, one engineer can even oversee multiple teams in parallel, so long as their tables are adjacent.

It's important not to let too many teams wait outside in line. If you ever get 2 or more teams waiting, and can't run them in parallel, you can speed up the station by making the pyramids smaller: 5 or 4 cups in the base, instead of 6. Or have everyone build their stacks against a wall, if one is available.

FINAL TIPS

You are the guardians of this room. Make sure nothing wanders off, any litter or messes are cleaned up, and everything gets put back where it was!

Do not shut down this station until the event lead or the solving station lead confirm that no more teams are en route. If you have parallel rooms, and are reasonably sure you've seen all the teams, it is ok to shut down all but one room, until you hear final confirmation.



STATION – REACTOR CORE

ANECDOTES FROM PAST EVENTS

Over the years, we've seen a number of things go sideways. If you have some spare time while you wait for the first team to arrive, read on. You never know when one will happen to your station.

Unsolved puzzles

Some teams show up at the station with a garbled answer. If they're close, feel free to help them find the real answer. Alternatively, point out the QR code in the bottom corner of the answer page -- it links to a web page that can show coaches how to get the correct answer. More rarely, a team that doesn't understand how the adventure works will show up without even trying to solve the puzzle. They likely think they were supposed to solve it together with you. These teams should be sent back to the cafeteria to work on the puzzle -- that's half the adventure!

Wrong station

Signs from the cafeteria to the stations may not be as clear as you thought. Eager teams will run to the first station that looks like a candidate. So double check that their answer page matches your station. If they should be elsewhere, help them find it. Then check your signs!!

One more team

By the end time of the adventure, your actors are probably exhausted, and eager to pack up. But all too often, there's one more team you didn't account for. If they show up after the station has closed down, all their math work will seem in vain. So double check before you close up -- send a runner to the cafeteria to confirm.

The mile-long line

Beware long queues of teams waiting to experience your station. Not only is waiting in line the least fun part of the evening, but antsy kids can have a hard time waiting patiently. Be creative to clear out queues as soon as they occur. Take two teams through a station at a time. Slim down the actor's lines. Give hints. Anything.

Teenagers

Teenagers are a fantastic second source of actors, volunteers, and even coaches. But beware leaving groups of them unsupervised in a classroom. Groups of teens with spare time between adventures can get unfortunate ideas for pranking their old elementary teachers and younger siblings.

Scared little ones

The youngest adventurers can be slow to catch on to the spirit of your station. If your station calls for bravery, they may be terrified. If it calls for comedy, the jokes may go completely over their head. Feel free to tone down the drama, talk through the jokes, or just feed them lines.

Tag-along siblings

Math Adventures are great family and community events. In order for parents to be able to coach and act, it's nice to also let them bring any pre-school age little siblings along for the ride. Those kids won't be interested in the math puzzles, but if you can loop them into the theatrics, do so. And if nothing else, make sure they get any token giveaways that their older siblings get.

Hidden supplies

Make sure everyone working a station knows where the stash of extra supplies are. This is all the more important when a station is split across two or more parallel rooms. Sometimes one actor thinks the supplies are all used up, when in fact there's a second stash in another box. Review all supplies at the start, including how much to give to each team that comes through, and how many total teams are expected.

No-show actors

If your station is really short-handed, you can go to the cafeteria, and draft a spare coach into acting service!

Moved furniture

Teachers care a lot about their classroom and its layout. Do everything you can to return everything to where you found it.

Make math fun for your school!

Math Adventure

Events combine

Puzzles + Theater + Teamwork + Rewards

www.MathAdventure.org

425-503-3698

david@mathadventure.org