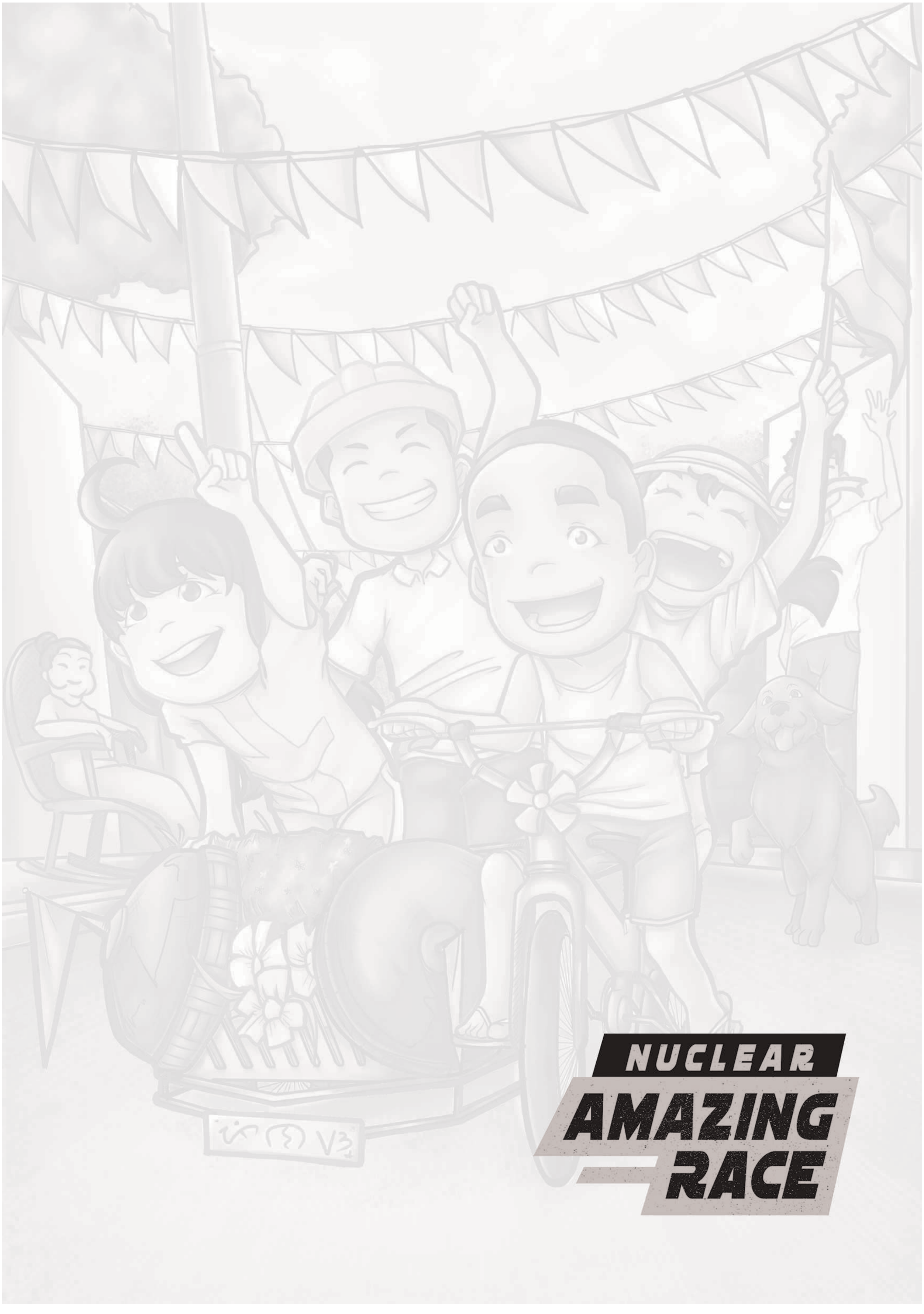
GUIDEBOOK

NUCLEAR
AMAZING
RACE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NUCLEAR AMAZING RACE GUIDEBOOK

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NUCLEAR AMAZING RACE

The Nuclear Amazing Race is an outreach activity designed for students and young professionals. In this activity, game contestants learn about the applications and developments in nuclear science and technology (NST) as they complete tasks and challenges in various race stations. During the race, contestants visit selected PNRI facilities and get a chance to interact with PNRI scientists and researchers. Tasks and challenges outlined in this guide maybe modified depending on the availability of materials, number and age of contestants, recent developments in NST and other related factors.

GAME RULES AND REGULATIONS

1. Players must be confirmed participants of the Nuclear Amazing Race. They will be divided into teams, with equal number of members, ranging from two to five players depending on the total number of participants.

2. All players must be in good health condition as the race involves physical activities such as running and brisk walking.

3. The Nuclear Amazing Race is composed of four (4) clusters: Food and Agriculture, Health, Industry, and Environment. The team with the shortest official time among all the other teams will be declared as the CHAMPION. The official time is the sum of the recorded time and penalty time.

4. All forms of cheating are prohibited. Ten (10) minutes time penalty will be given for cheating like using gadgets, skipping stations and inducing harm or sabotaging teammates or participants from other teams.

5. Three (3) minutes time penalty will be given for misconduct such as cursing and disobedience to the rules stated by the facilitators.

RACE STRUCTURE

Teams must leave from the same starting point called the “Pit Start” and travel to different locations/stations in the map provided.

Stations are categorized into four (4) clusters namely: Food and Agriculture, Health, Industry, and Environment. Each cluster comes with a “passport”.

Teams must perform tasks in each station to get clues or instructions to proceed to the next station . The team earns a stamp in their “passports” for each task that is successfully completed.

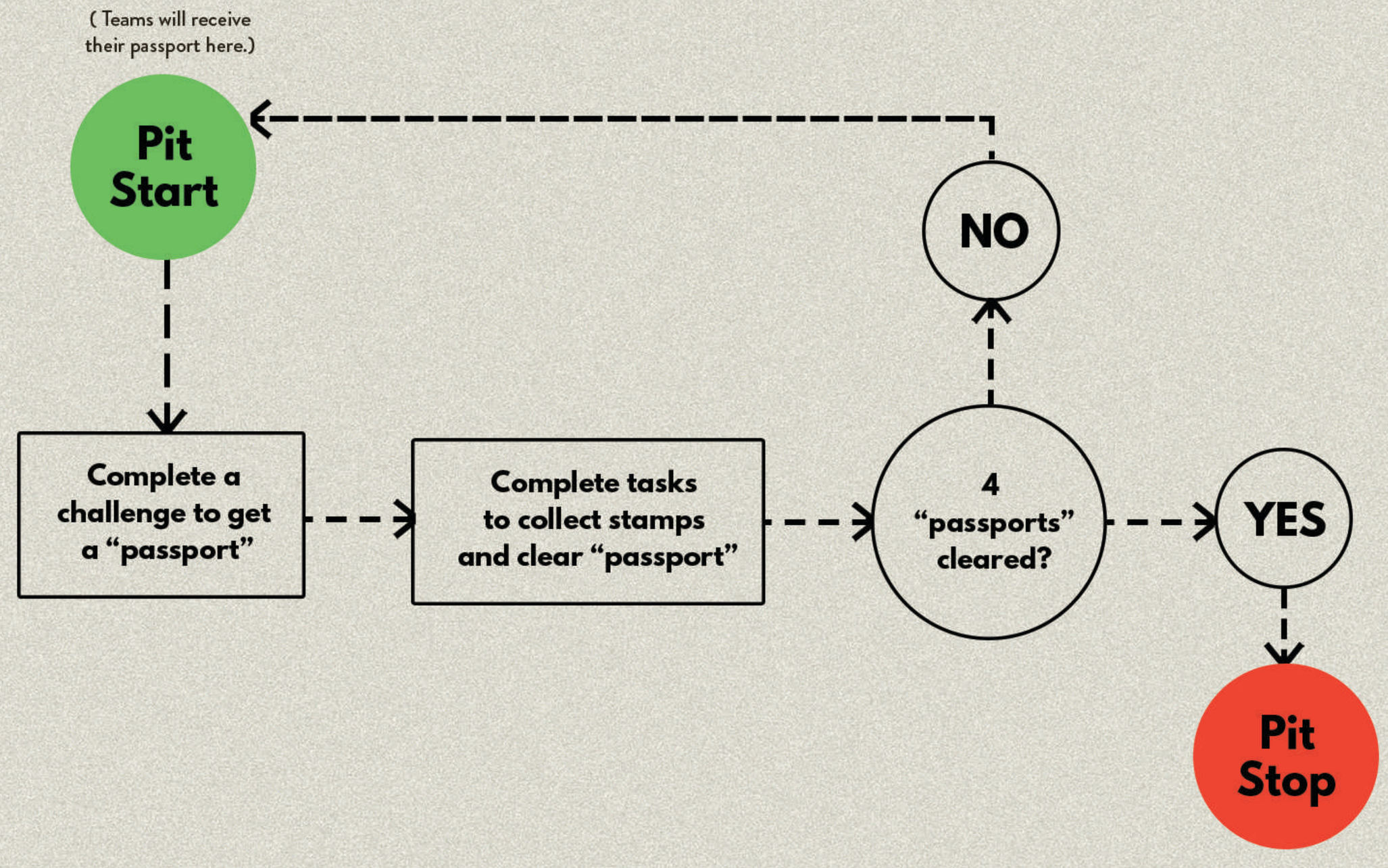
Teams must complete a challenge to get a passport and move to another cluster. Challenges may be one of the following:

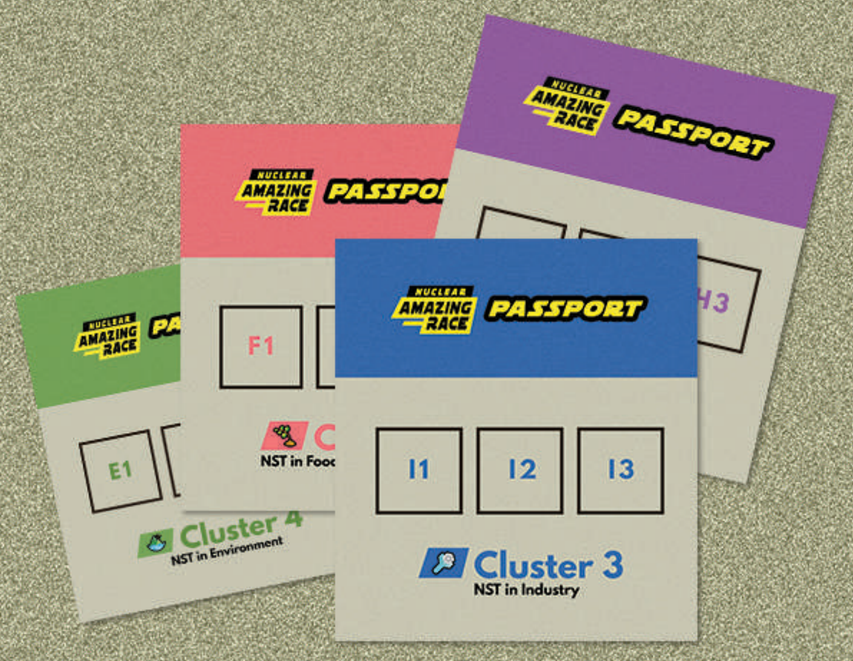
(1) Rock-Paper-Scissors tournament, (2) Groufie challenge, (3) Make a line, (4) Uniwalk, or (5) Treasure hunting.

The first team to collect all four passports with complete stamps will receive the final clue to where the “Pit Stop” is.

The goal of each team is to complete the race as quickly as possible. The first team to complete their tasks and arrive at the Pit Stop will be declared as champions.

RACE DIAGRAM





PASSPORT AND MAP

TASKS AND CHALLENGES

Cluster 1
NST in Food and Agriculture

STATION 1

In this station, participants will visit the PNRI Cobalt-60 Multipurpose Irradiation Facility to learn about the application of nuclear techniques in precision farming, and complete the task of transferring seeds and grains from point A to point B using chopsticks.

Materials: Seeds and grains of various sizes, chopsticks

STATION 2

In this station, participants will visit the PNRI Food Irradiation laboratory to learn about food irradiation techniques and complete an "Eating" Challenge.

Materials: Baskets containing various food items

STATION 3

In this station, participants will learn about crop improvement using nuclear and stable-isotope techniques. Then, they will visit the PNRI Soils Laboratory to identify a plant mutant called "Medina."

Materials: Different plants and mutants

TASKS AND CHALLENGES

Cluster 2

NST in Health and Medicine

STATION 1

In this station, participants will learn about gamma sterilization of medical products and devices. Participants will visit the PNRI Library and play a game called “particle cups” to find the hidden gamma particles.

Materials: Plastic cups

STATION 2

In this station, participants will visit the PNRI Entomology Laboratory to learn about Sterile Insect Technique (SIT) , and complete a relay challenge related to the mosquito life cycle.

Materials: Needles, thread, forceps, dropper, petri dish, larva, pupa and adult mosquitoes

STATION 3

In this station, participants will visit the PNRI Molecular Biology Laboratory to learn about cytogenetic biodosimetry. They will interact with researchers/scientists in the lab to get information needed to answer the challenge questions. The participants will then locate the “symbol” of the correct answer inside the PNRI compound.

Materials: N/A

TASKS AND CHALLENGES

Cluster 3

NST in Industry

STATION 1

In this station, participants will visit the PNRI Chemistry Section to learn how radiation technology is used for material modification. Then, they will be asked to identify the name of the product, modified through radiation processing, based on their descriptions. A "time penalty" for every wrong answer will be imposed.

Materials: Radiation-processed products, description cards

STATION 2

In this station, participants will visit the PNRI Electron Beam Irradiation Facility to learn about radiation processing, using high speed electrons, in the production of materials which exhibits a set of desired characteristics. Then, participants will complete a task to get the clue for the next station.

Materials: Materials: plastic cups, rubber band

STATION 3

In this station, participants will visit the PNRI Nuclear Analytical Techniques and Applications Section to learn about how nuclear techniques are used to ensure the quality and safety of consumer products. Participants will then be asked to identify products that "fail" to meet a safety standard based on the analysis reports provided. A time penalty for every wrong answer will be imposed.

Materials: Analysis report of various consumer products, radionuclide safety standards

TASKS AND CHALLENGES

Cluster 4
NST in Environment

STATION 1

In this station, participants will visit the PNRI Nuclear Training Center to learn about radioactivity monitoring. Using a survey meter, participants will do radioactivity monitoring to locate a radioactive source.

Materials: Survey meter, monitoring board with check source

STATION 2

In this station, participants will visit the PNRI Applied Physics Section to learn about resource management of raw materials such as uranium ores. Participants will interact with scientists/researches and answer question to get the clue to the next station.

Materials: Element's symbol placards

STATION 3

In this station, participants will proceed to the PNRI Isotope-Ratio Mass Spectrometer Laboratory and learn about radiometric profiling. They will be asked to map the timeline of radionuclide occurrence of the west Philippine Sea and answer questions related to the timeline.

Materials: Data on radiometric profiling of the corals in west PH sea

RACE MATERIALS

clue cards

CHALLENGE:
The Father

Answer this question to proceed to the next cluster:

Who is the Father of Atomic Energy in the Philippines, and the first commissioner of the Philippine Atomic Energy Commission (PAEC), which later became PNRI?

Hint: Find his statue.

Station 1
Nuclear S & T in the Environment

Radioactivity Monitoring

Some of the services being offered by PNRI includes monitoring of radiation in the environment and rental of instruments such as survey meters and moisture density gauge. Survey meters are used to detect and measure radiation while moisture density gauges are used in road construction.

Go to the Nuclear Training Center in the Admin Building, and using a survey meter, find the area which contains the source of radioactivity. Ask for assistance in using survey meters.

Station 2
Nuclear S & T in Food and Agriculture

Food Irradiation

Irradiating food has the same benefits as when it is heated, refrigerated, frozen, or treated with chemicals, but without changing the temperature or leaving residue. This technique controls spoilage and food-borne pathogenic microorganisms or insect pests without significantly affecting the taste or smell.

This is an Eating Challenge. You will pick a basket which contains food. All members must eat and finish one serving of either solid or liquid food. Proceed to Food Irradiation Laboratory in the modular buildings.

Station 3
Nuclear S & T in Industry

Nuclear Analytical Techniques

A variety of consumer products contain radioactive materials; in some, radiation is present because of the radionuclide components that are present in them. Nuclear analytical techniques ensure that the levels of radionuclide present in these products are within the allowable limits.

You can find different consumer products that undergo nuclear analytical techniques in the Nuclear Analytical Techniques and Applications Section (NATAS) inside the ARC Building. Using the provided results of analysis, determine the products that fail the limits of radioactivity.

There is a time penalty for every wrong answer.

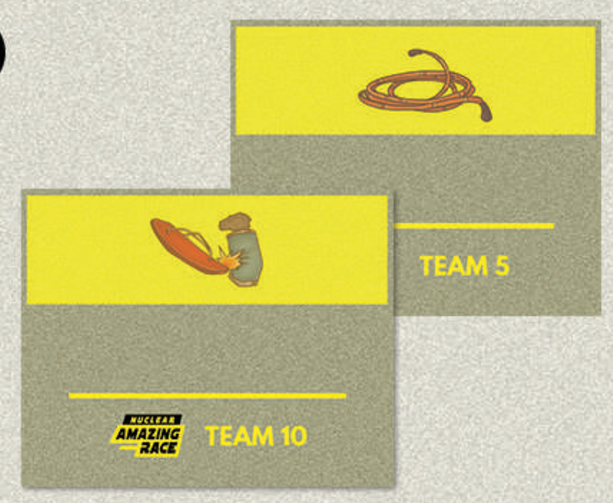
PIT STOP!

Congratulations!
You have received your final clue card for the Nuclear Amazing Race.

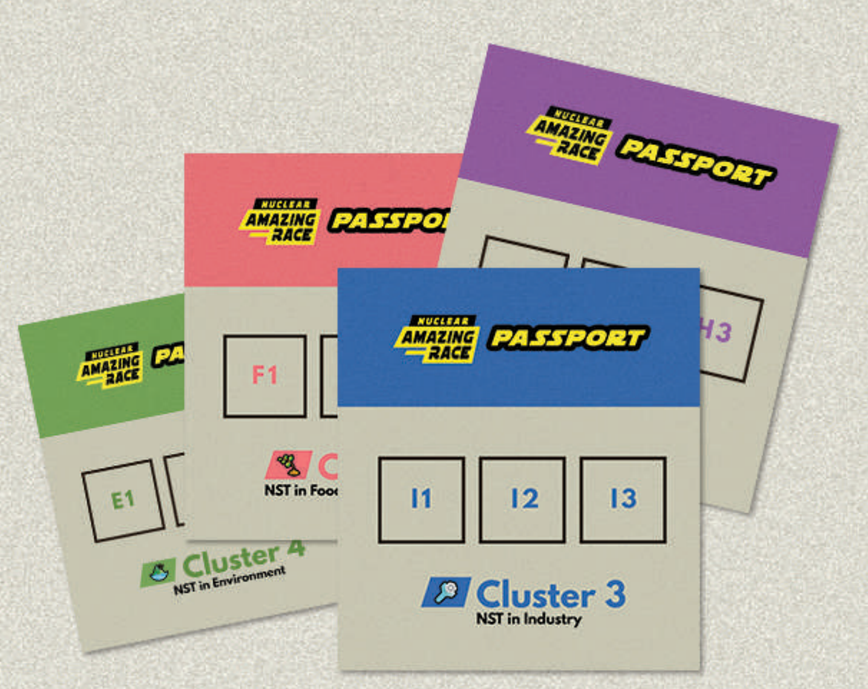
Proceed to the back entrance of the Philippine Research Reactor 1 (PRR-1), and look for the PIT STOP.

map

team tags



passports



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