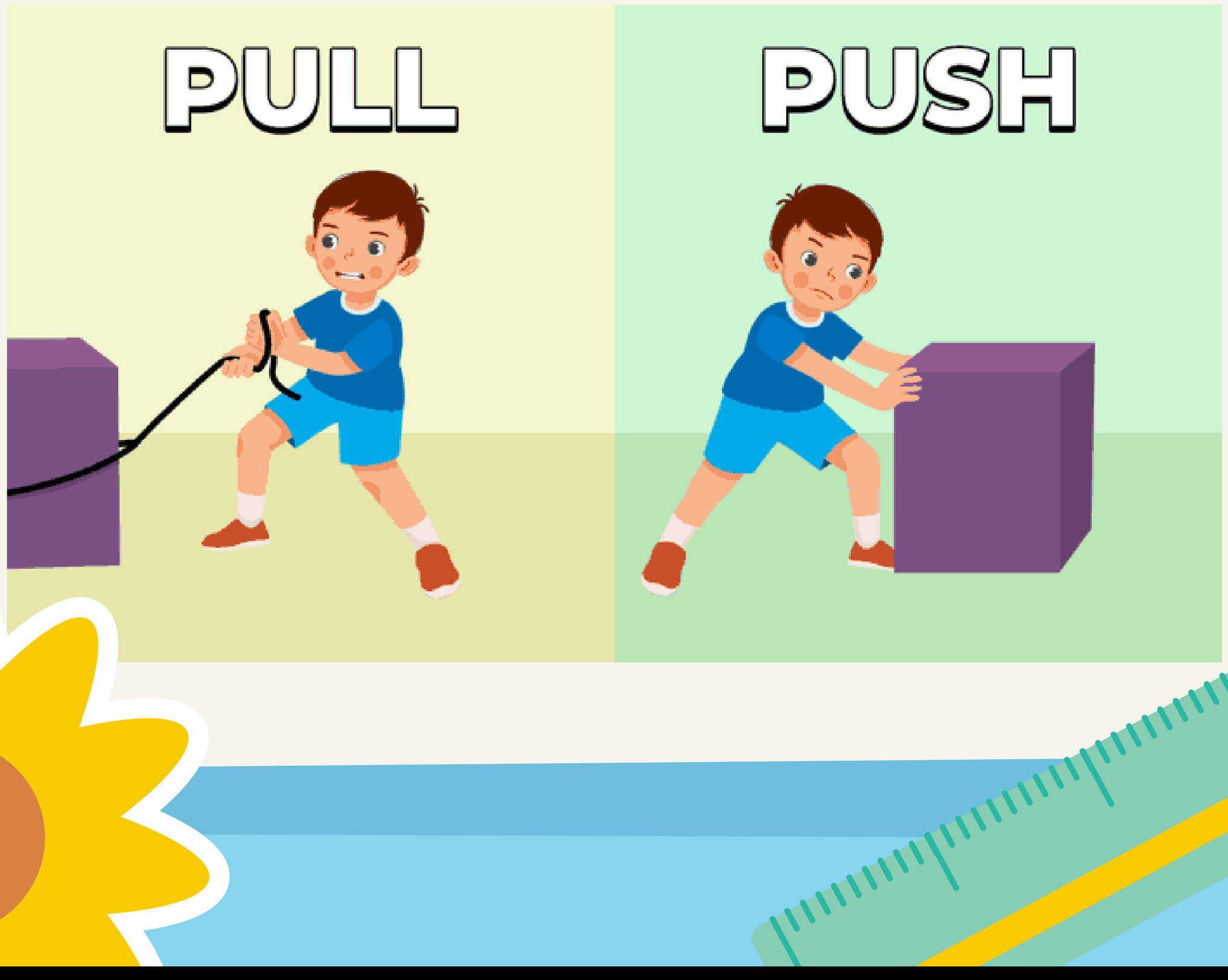
THRUST TRAIL

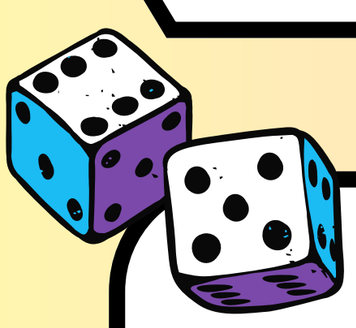


THRUST TRAIL

Game Theme
Forces

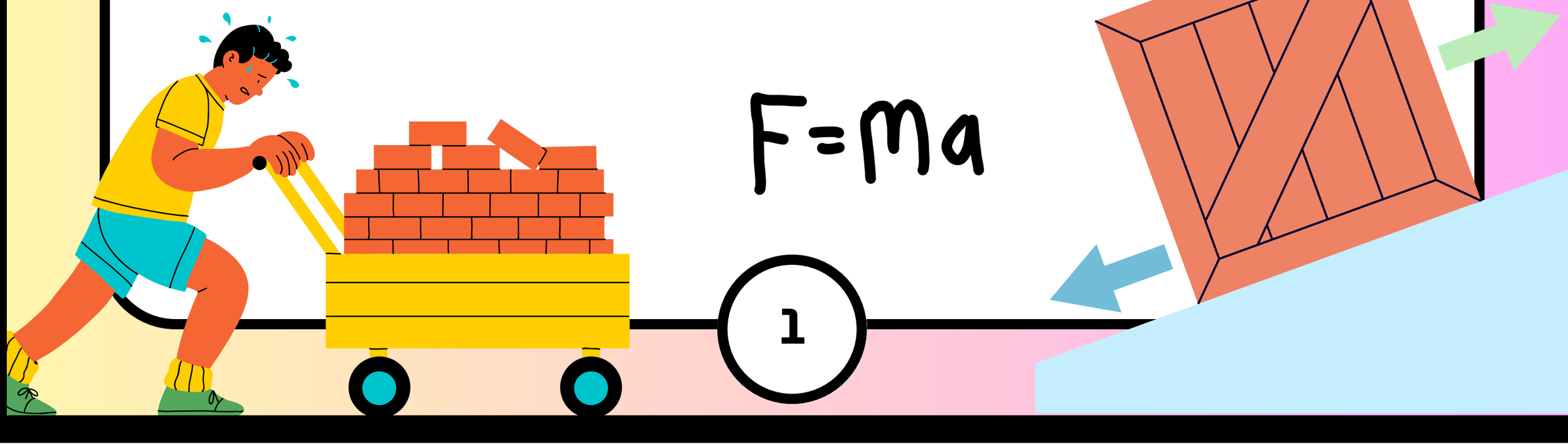
Grade Level
V-VIII

Game Type
Board Game



Game Overview

- Thrust Trail is a board-and-card-based assessment game that helps students consolidate their understanding of forces and their effects on objects. The game integrates hands-on activities and conceptual questions to reinforce classroom learning in an engaging way. As players navigate the board, they encounter cards that highlight different force effects, such as changing motion, direction, shape, or speed.
- The game assumes that students are already familiar with the topic of force, including basic terms such as push, pull, motion, and effects of force on different objects.
- By the end of the game, students will be able to describe different types of forces, identify their effects on objects, and demonstrate concepts through simple physical tasks.
- A complete game set, for one group, includes the following materials:
  - Game board
  - Dice
  - Player counters (one per student)
  - 15 cards (including question cards and activity cards)
  - Props for activities: Ball, play-doh or soft clay, toy car, book
  - Answer sheet



Gameplay Instructions

- Divide students into groups of 4–5. Distribute one full game set per group.
- Shuffle the 15 cards and keep them in a single stack (in order or randomly).
- Each player selects a counter and places it on the Start space.
- Players take turns rolling the dice and move their counter forward based on the number rolled.
- Each space on the board either leads to a card prompt (e.g., “Read card 4”) or a game instruction (e.g., go back, submit password).
- If a player lands on a space that says "Read Card", they must draw the corresponding card and respond to its instructions.
    - Question Cards: Answer the conceptual prompt.
    - Activity Cards: Use the provided props (e.g., ball, toy car, Play-Doh) to complete the task and explain their observation.
- Dice Modifiers:
    - Roll a 4: roll again
    - Roll a 5: roll twice
    - Roll a 6: miss your turn
- If the player responds correctly or completes the activity, they stay on the space; if not, the teacher may ask them to go back or assist with peer support.
- That player first reaches the Finish space is declared the winner.

Debriefing and Reflection

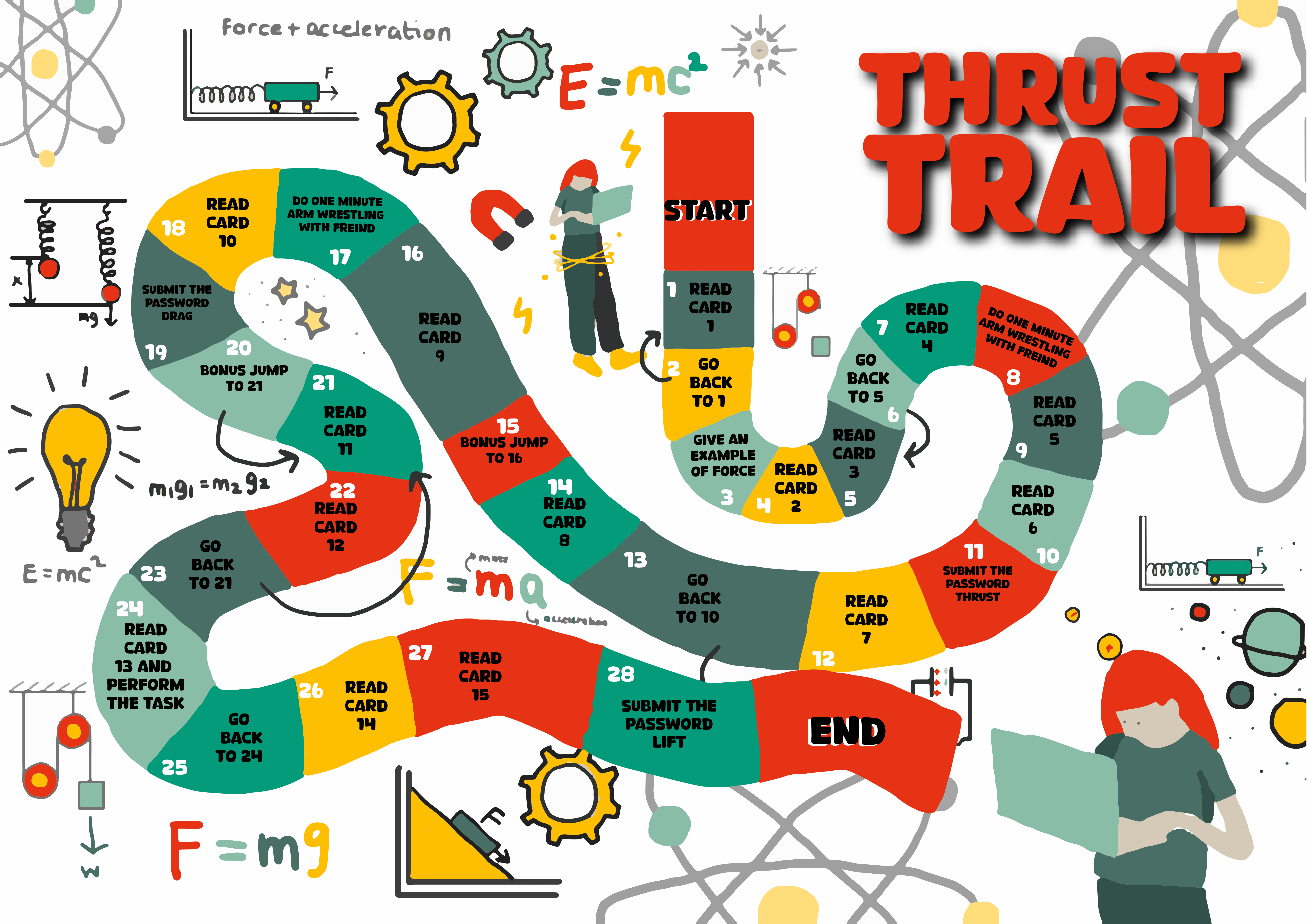
Conclude the game with a whole-class reflection to reinforce learning. Suggested discussion prompts:

- Ask students to summarise the do’s and don’ts of how forces act on different objects (e.g., pushing gently vs. pushing forcefully, stopping vs. redirecting motion).
- Discuss which cards or tasks were the most difficult and why. Clarify any confusion using the answer sheet.
- Revisit key concepts such as force representation with arrows, measurement using Newtons, and combined effects of multiple forces.
- Encourage students to connect gameplay with real-life examples, such as playing sports, riding bicycles, or using tools.

Adaptations for Gamplay

For Lower Grades: Use only the simpler cards and remove or simplify the activity instructions. Allow students to perform tasks with teacher demonstration or visual aids if props are unavailable.

For Higher Grades: Add complexity by including real-life applications of force (e.g., friction, gravity, thrust, air resistance). Include extension questions such as predicting outcomes, drawing force diagrams, or explaining balanced vs. unbalanced forces.



THRUST TRAIL
START
1 READ CARD 1
2 GO BACK TO 1
3 GIVE AN EXAMPLE OF FORCE
4 READ CARD 2
5 READ CARD 3
6 GO BACK TO 5
7 READ CARD 4
8 DO ONE MINUTE ARM WRESTLING WITH FREIND
9 READ CARD 5
10 READ CARD 6
11 SUBMIT THE PASSWORD THRUST
12 READ CARD 7
13 GO BACK TO 10
14 READ CARD 8
15 BONUS JUMP TO 16
16 READ CARD 9
17 DO ONE MINUTE ARM WRESTLING WITH FREIND
18 READ CARD 10
19 SUBMIT THE PASSWORD DRAG
20 BONUS JUMP TO 21
21 READ CARD 11
22 READ CARD 12
23 GO BACK TO 21
24 READ CARD 13 AND PERFORM THE TASK
25 GO BACK TO 24
26 READ CARD 14
27 READ CARD 15
28 SUBMIT THE PASSWORD LIFT
END
Force + acceleration
F
E=mc²
x
mg
m₁g₁ = m₂g₂
E=mc²
F=ma
mass
acceleration
F=mg
W
F

CARDS

CARD 1 T

A FORCE IS A PUSH OR A PULL.
OBSERVE HOW THE FORCE
AFFECTED THE CAR'S MOTION.

CARD 2 H

ACTIVITY: CHANGE IN COURSE
A FORCE IS A PUSH OR A PULL.
OBSERVE HOW THE FORCE
AFFECTED THE CAR'S MOTION.
OBJECTIVE: DEMONSTRATE HOW A FORCE CAN
CHANGE THE DIRECTION OF A MOVING OBJECT.
INSTRUCTIONS:ROLL A BALL ACROSS A FLAT SURFACE.
USE A BARRIER OR YOUR HAND
TO GENTLY CHANGE THE BALL'S
DIRECTION WHILE IT'S IN MOTION.
OBSERVE HOW THE APPLIED FORCE
ALTERS THE BALL'S ORIGINAL PATH

CARD 3 R

A FORCE CAN CHANGE
THE SHAPE OF AN OBJECT

CARD 4 U

ACTIVITY: SHAPE SHIFTER
OBJECTIVE: OBSERVE HOW A FORCE CAN
CHANGE THE SHAPE OF AN OBJECT.
INSTRUCTIONS:TAKE SOFT MATERIAL
LIKE CLAY OR PLAY-DOUGH.
APPLY A FORCE BY PRESSING AND MANIPULATING
THE MATERIAL TO CHANGE ITS SHAPE.
OBSERVE HOW THE FORCE APPLIED WITH
YOUR HANDS ALTERS THE SHAPE OF THE MATERIAL.

CARD 5 S

A FORCE CAN STOP
MOVING OBJECT

CARD 6 T

ACTIVITY: SPEED BREAKER
OBJECTIVE: DEMONSTRATE HOW A FORCE
CAN MAKE A MOVING OBJECT STOP.
INSTRUCTIONS:SET UP A TOY CAR ON
A FLAT SURFACE. GIVE IT A GENTLE
PUSH TO SET IT IN MOTION.
USE YOUR HAND AS A
BARRIER TO APPLY A FORCE AND MAKE
THE MOVING TOY CAR COME TO A STOP.

Force + acceleration

$E=mc^2$

CARD 7

D

A FORCE CAN SPEED UP,
SLOW DOWN AN OBJECT.

$E=mc^2$

$E=mc^2$

$E=wc_7$

Force + acceleration

$E=mc^2$

CARD 8

R

ACTIVITY: SPEED RACER
A FORCE CAN SPEED UP,
SLOW DOWN AN OBJECT.
OBJECTIVE: OBSERVE HOW FORCE
CAN SPEED UP AND SLOW DOWN AN OBJECT.
INSTRUCTIONS:USE A TOY CAR OR A SMALL
OBJECT ON A SMOOTH SURFACE.APPLY A GENTLE
PUSH TO MAKE IT MOVE AT A MODERATE SPEED.
APPLY A STRONGER PUSH TO SPEED IT UP,
AND THEN A LIGHT TOUCH TO SLOW IT DOWN.
OBSERVE THE CHANGED IN SPEED
DUE TO THE VARYING FORCE APPLIED

$E=mc^2$

$E=mc^2$

$E=wc_7$

Force + acceleration

$E=mc^2$

CARD 9

A

A FORCE CAN CHANGE THE
DIRECTION OF A MOVING OBJECT.

$E=mc^2$

$E=mc^2$

$E=wc_7$

Force + acceleration

$E=mc^2$

CARD 10

G

THE SIZE OF A FORCE
CAN BE MEASURED
USING A FORCE METER
OR SPRING BALANCE.

$E=mc^2$

$E=mc^2$

$E=wc_7$

Force + acceleration

$E=mc^2$

CARD 11 L

FORCES ARE MEASURED IN NEWTONS (N).

$E=mc^2$

$E=mc^2$

$E=mc^2$

Force + acceleration

$E=mc^2$

CARD 12 I

A FORCE CAN BE REPRESENTED BY AN ARROW. THE LENGTH OF THE ARROW REPRESENTS THE SIZE OF THE FORCE AND THE ARROW HEAD INDICATES ITS DIRECTION.

$E=mc^2$

$E=mc^2$

$E=mc^2$

Force + acceleration

$E=mc^2$

CARD 13 F

ACTIVITY 1: PUSH AND PULL
OBJECTIVE: UNDERSTAND THE EFFECTS OF FORCES ON OBJECTS.
INSTRUCTIONS: FIND AN OBJECT (E.G.. A BOOK).PUSH THE OBJECT GENTLY AND OBSERVE ITS MOTION. PULL THE OBJECT GENTLY AND OBSERVE ITS MOTION. TELL YOUR FRIENDS WHAT HAPPENS TO THE OBJECT WHEN FORCE IS APPLIED IN EACH CASE.

$E=mc^2$

$E=mc^2$

$E=mc^2$

Force + acceleration

$E=mc^2$

CARD 14 T

SEVERAL FORCES CAN ACT ON AN OBJECT, E.G DIFFERENT FORCES ACT ON AN AEROPLANE FLYING IN THE AIR.

$E=mc^2$

$E=mc^2$

$E=mc^2$

Force + acceleration

$E=mc^2$

CARD 15

PAIR OF FORCES ACTING ON AN AIR PLANE

$E=mc^2$

$E=mc^2$

$E=mc^2$