

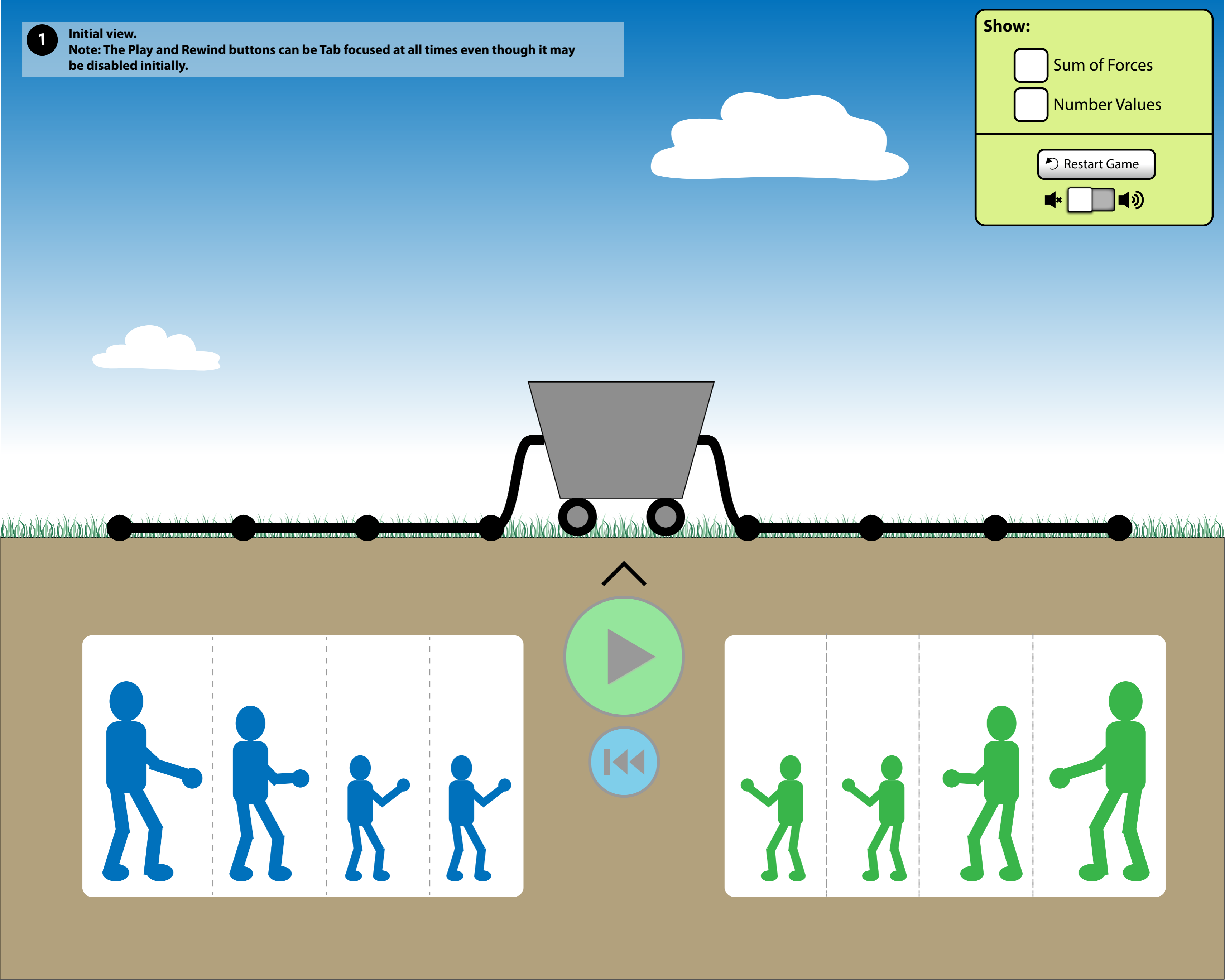
1 Initial view.
Note: The Play and Rewind buttons can be Tab focused at all times even though it may be disabled initially.

Show:

- Sum of Forces
- Number Values

Restart Game

Speaker icon, volume slider, speaker icon



2 The user has pressed the TAB key. Left team group gains an interaction highlight. A cursor appears above the first puller. The puller waves to the user to get their attention.

When a group get highlighted, the cursor always appears above / next to the first interesting item that can be interacted with.

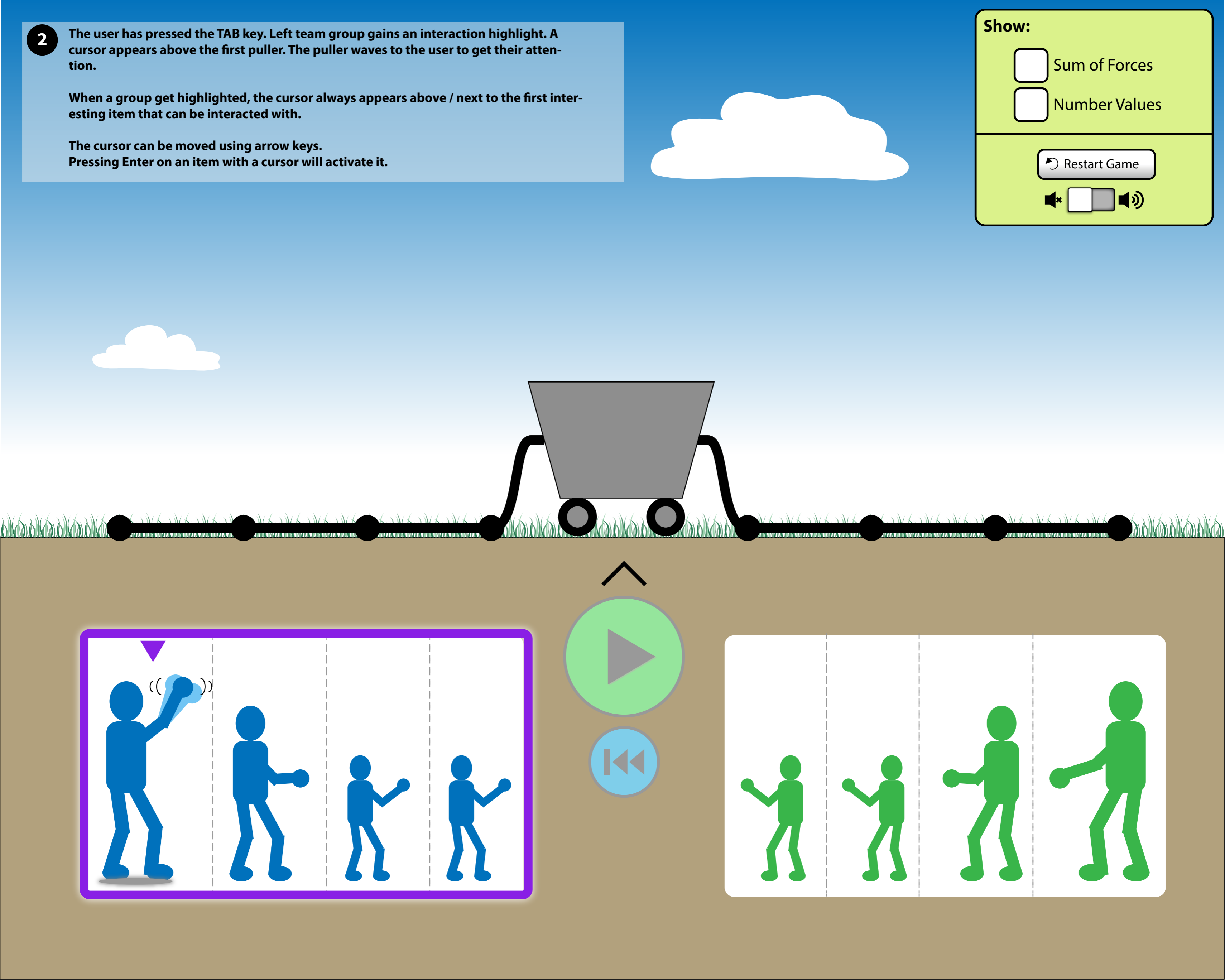
The cursor can be moved using arrow keys. Pressing Enter on an item with a cursor will activate it.

Show:

Sum of Forces

Number Values

[Restart Game](#)



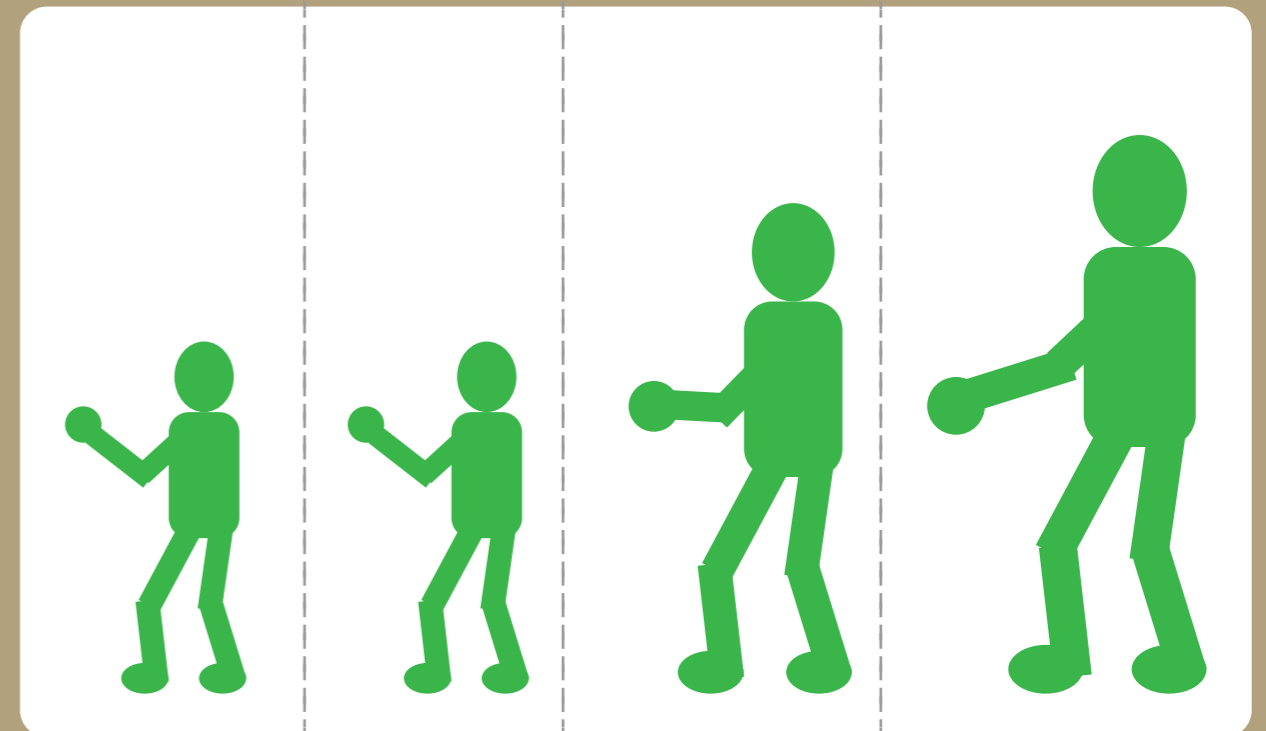
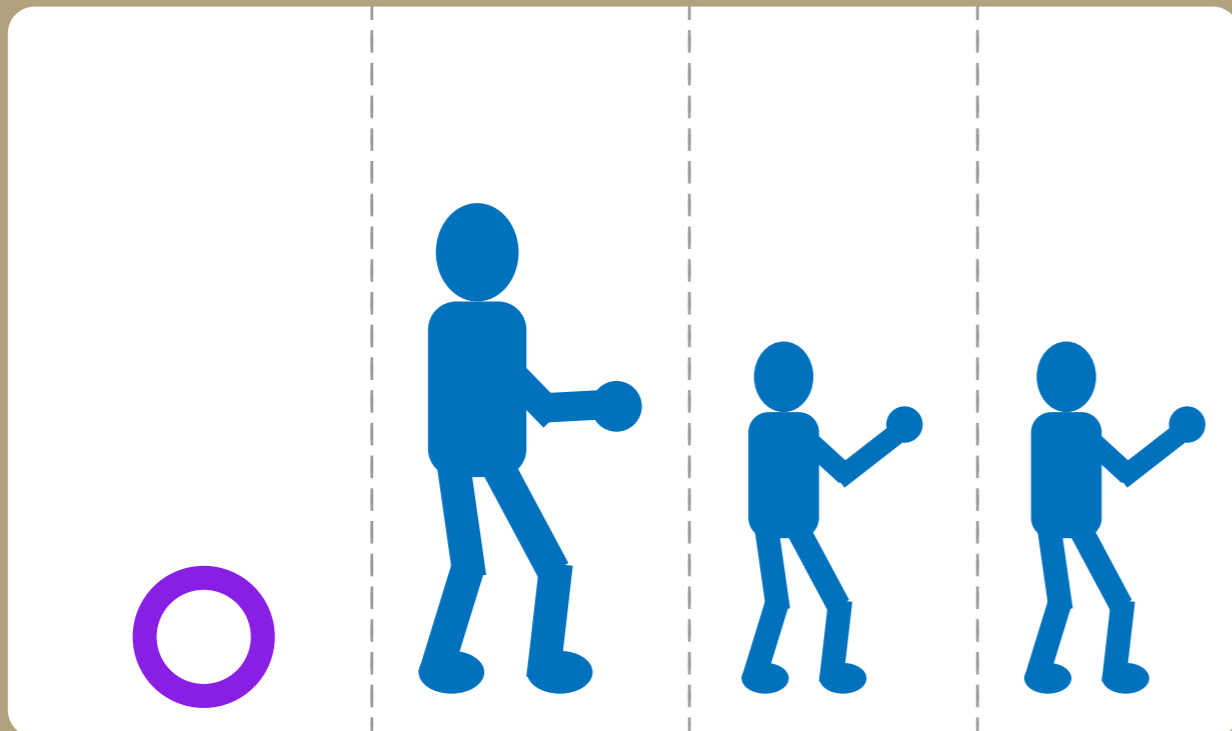
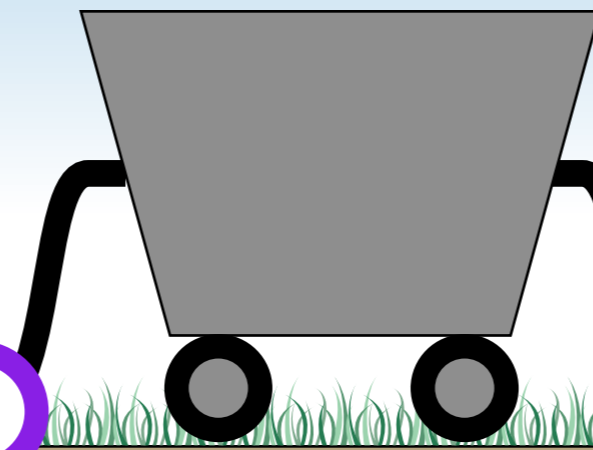
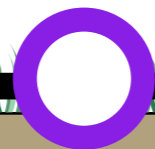
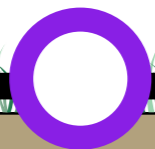
3 The user has pressed Enter on the puller, and the puller pops up above the rope. Landing zones become highlighted to indicate where the puller can be moved to.

The puller's feet dangle / swing slightly from side to side to indicate they want to be put down somewhere. Dots animate downward to indicate where the puller will go.

Show:

- Sum of Forces
- Number Values

Restart Game



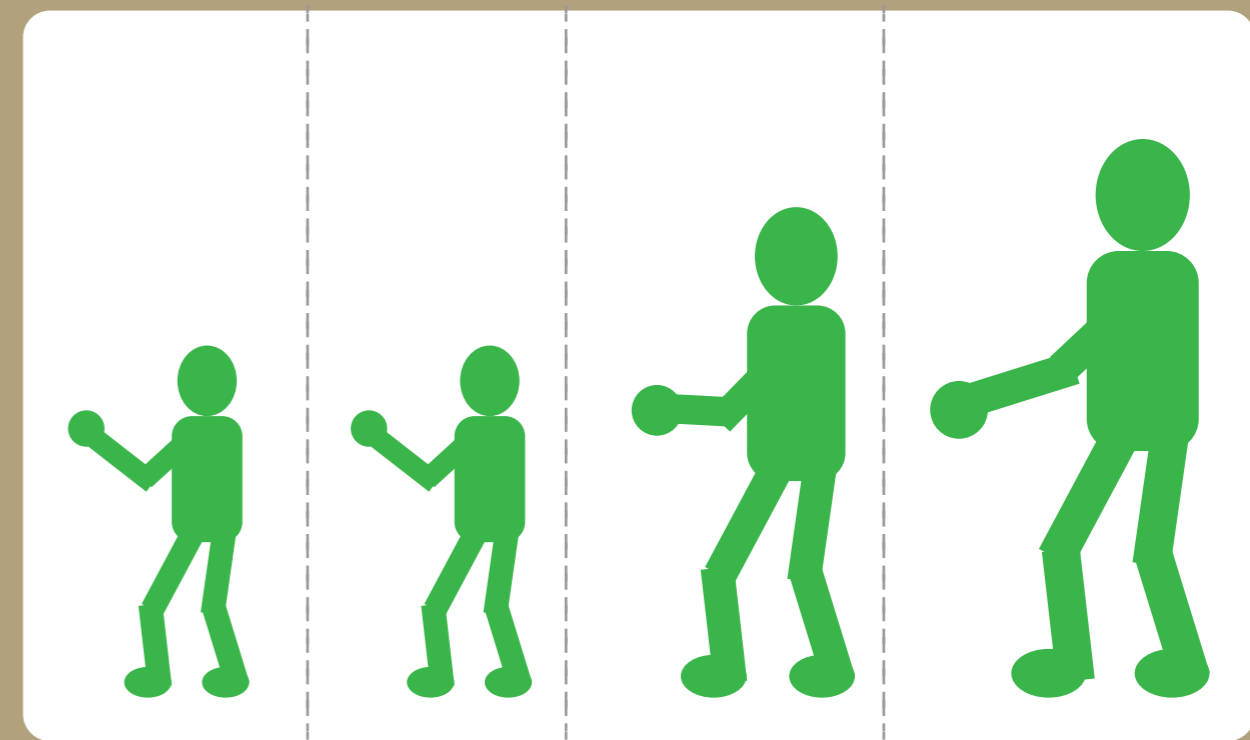
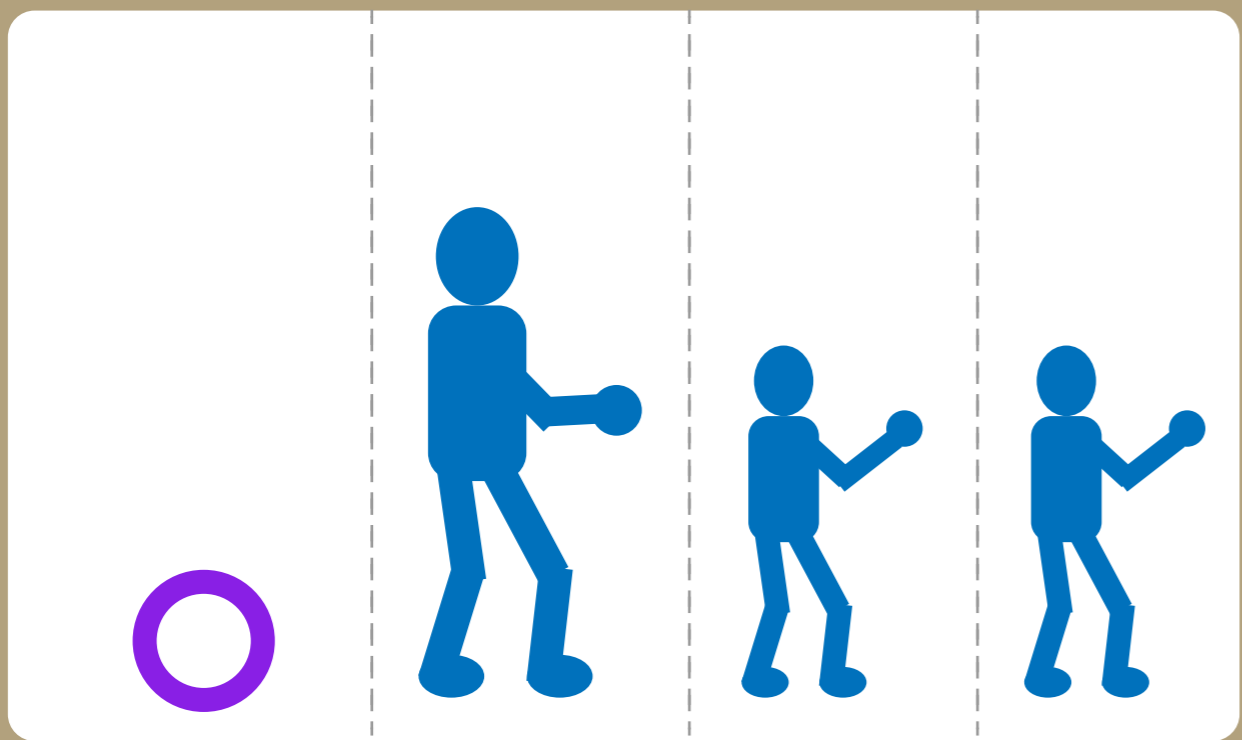
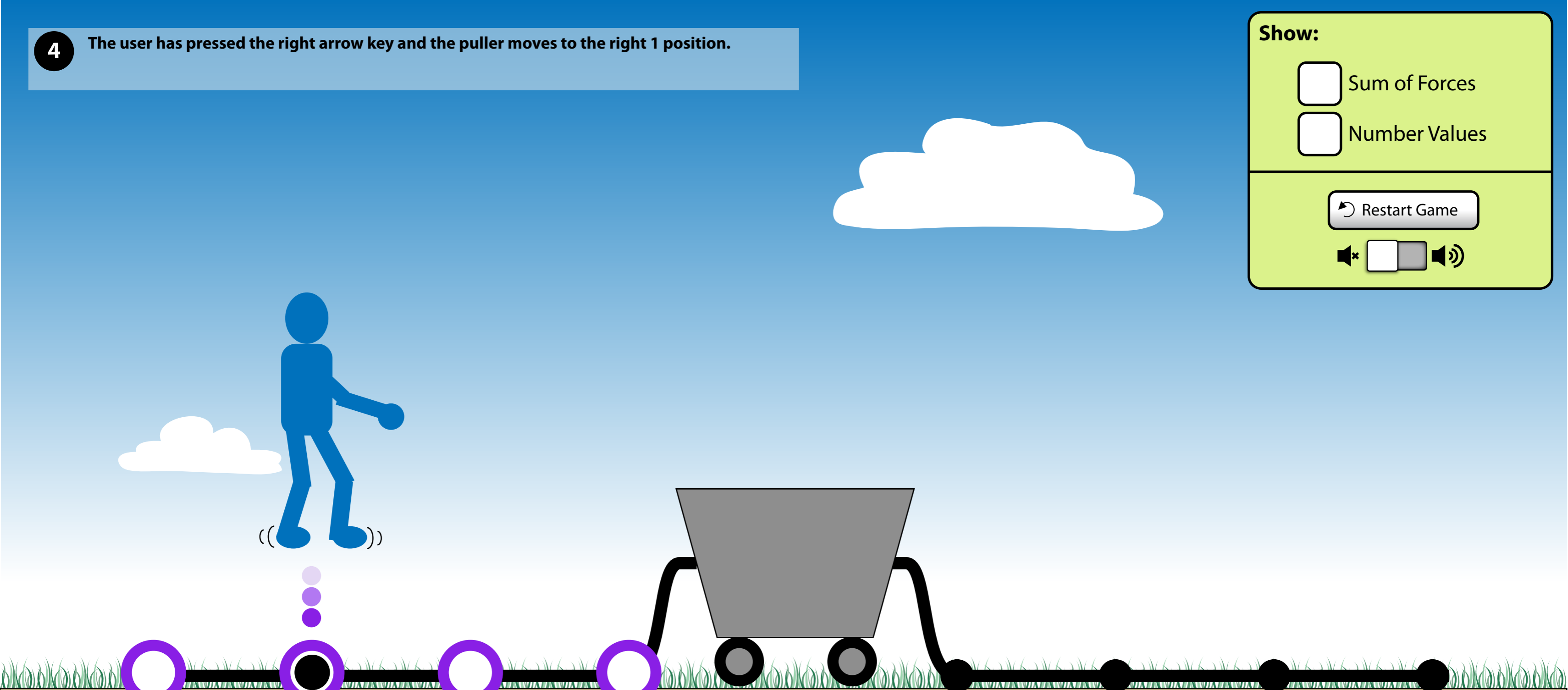
4 The user has pressed the right arrow key and the puller moves to the right 1 position.

Show:

- Sum of Forces
- Number Values

Restart Game

Speaker icon and volume slider



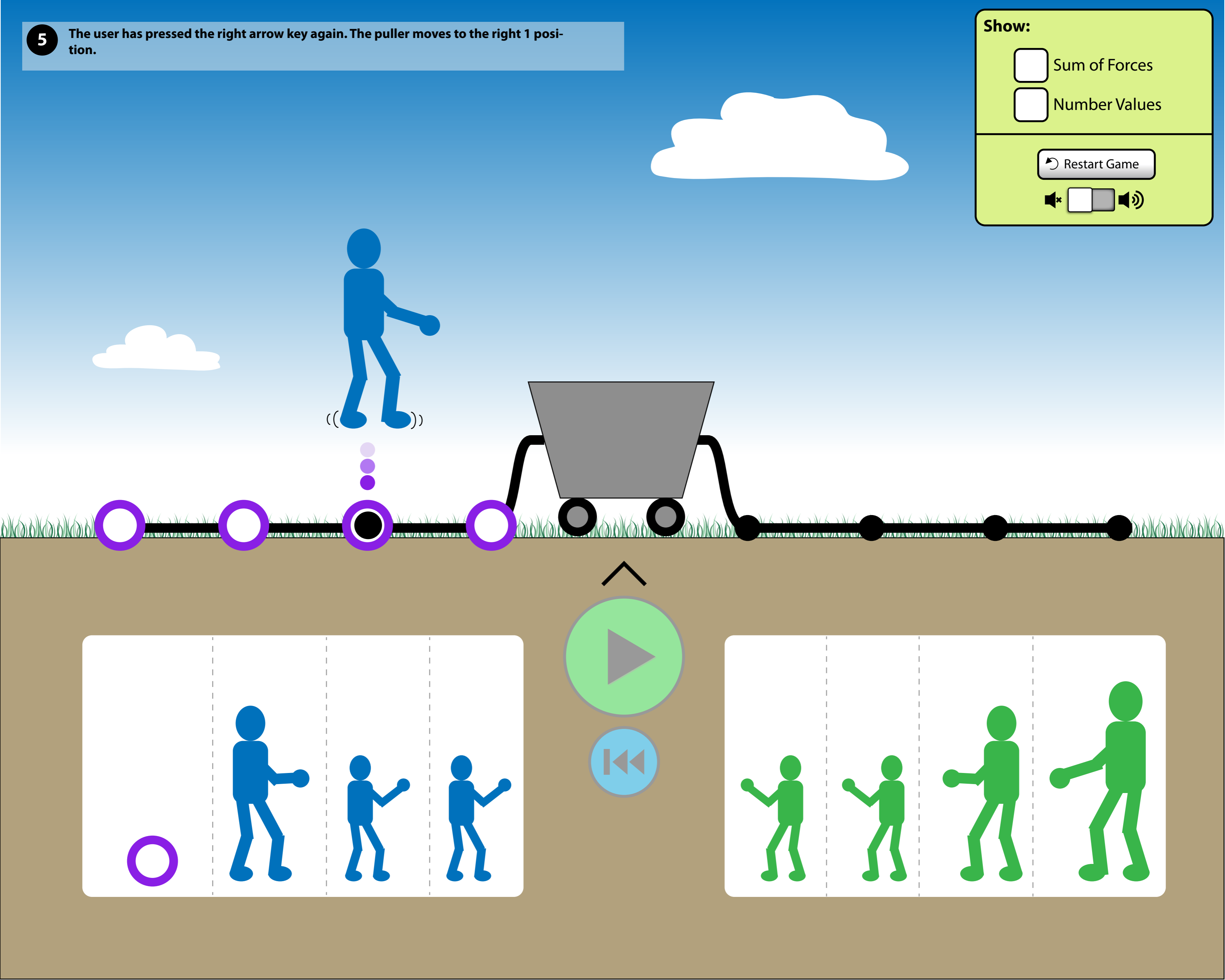
5 The user has pressed the right arrow key again. The puller moves to the right 1 position.

Show:

- Sum of Forces
- Number Values

Restart Game

Speaker icon, volume slider, speaker icon



6

The user has pressed Enter. The puller drops down into position.

An interaction highlight appears back on the left team. Like before, when a highlight appears, the first interesting interactive item gets a cursor placed above / next to it.

If the user chooses to, they can select any of the other left team members to place. The interaction follows similarly to Slides 3-6.

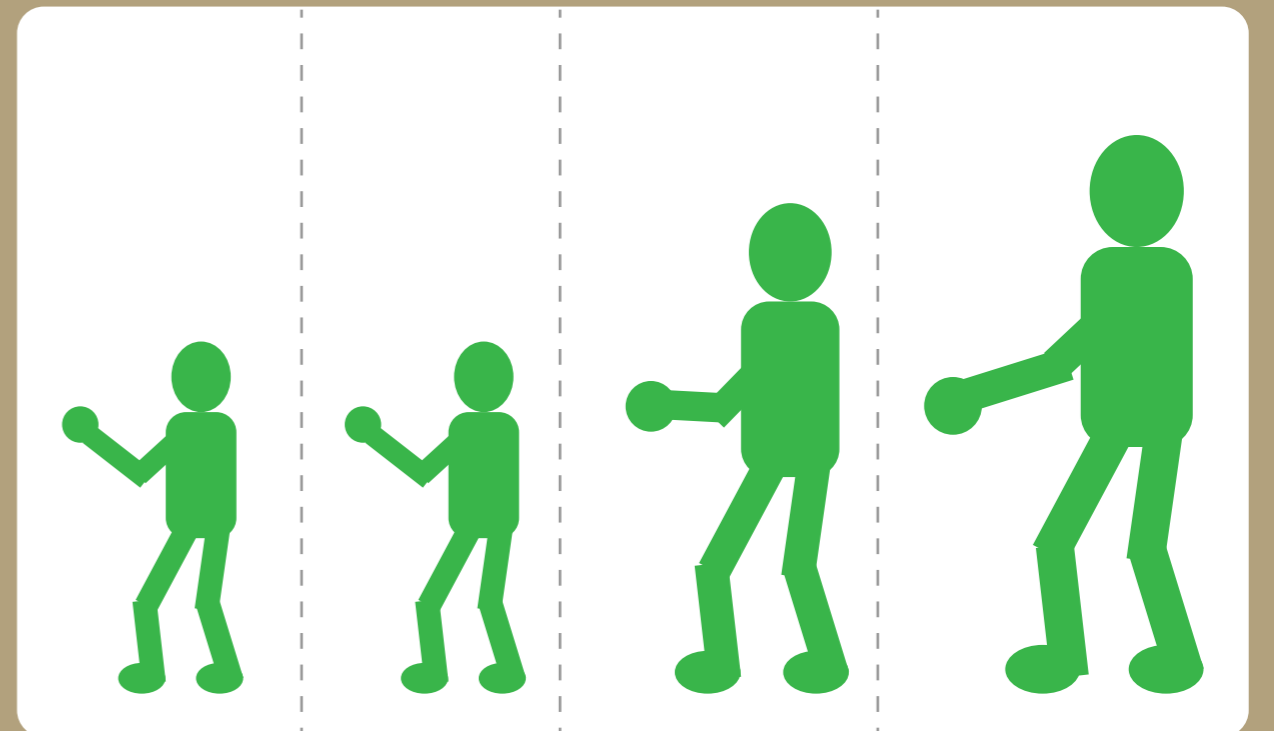
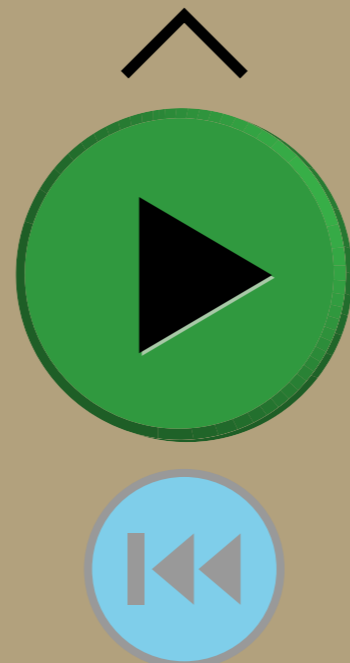
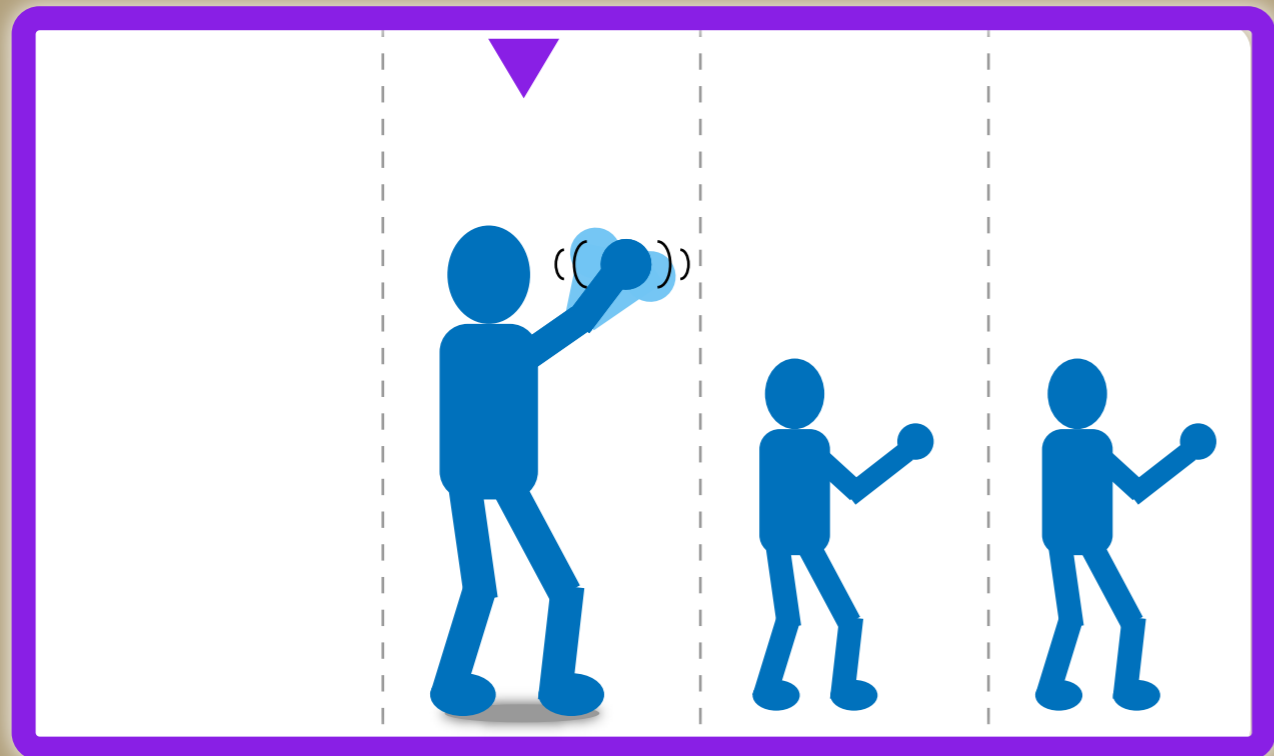
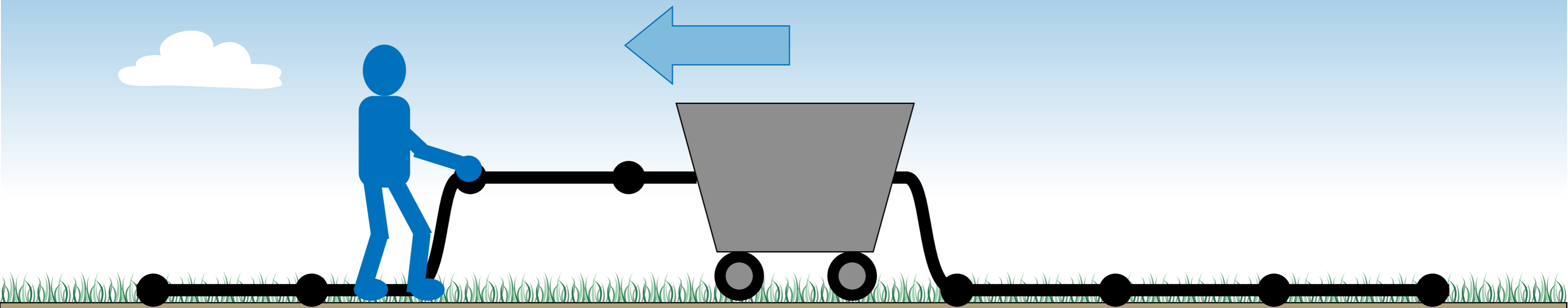
The Play button becomes enabled when at least 1 puller is on the ropes. The Rewind button is disabled because the simulation has not been run.

Removing all pullers from the ropes will cause the buttons to become disabled.

Show:

Sum of Forces

Number Values



7 The user has pressed TAB. The interaction highlight moves to the next interesting group - in this case the right group.

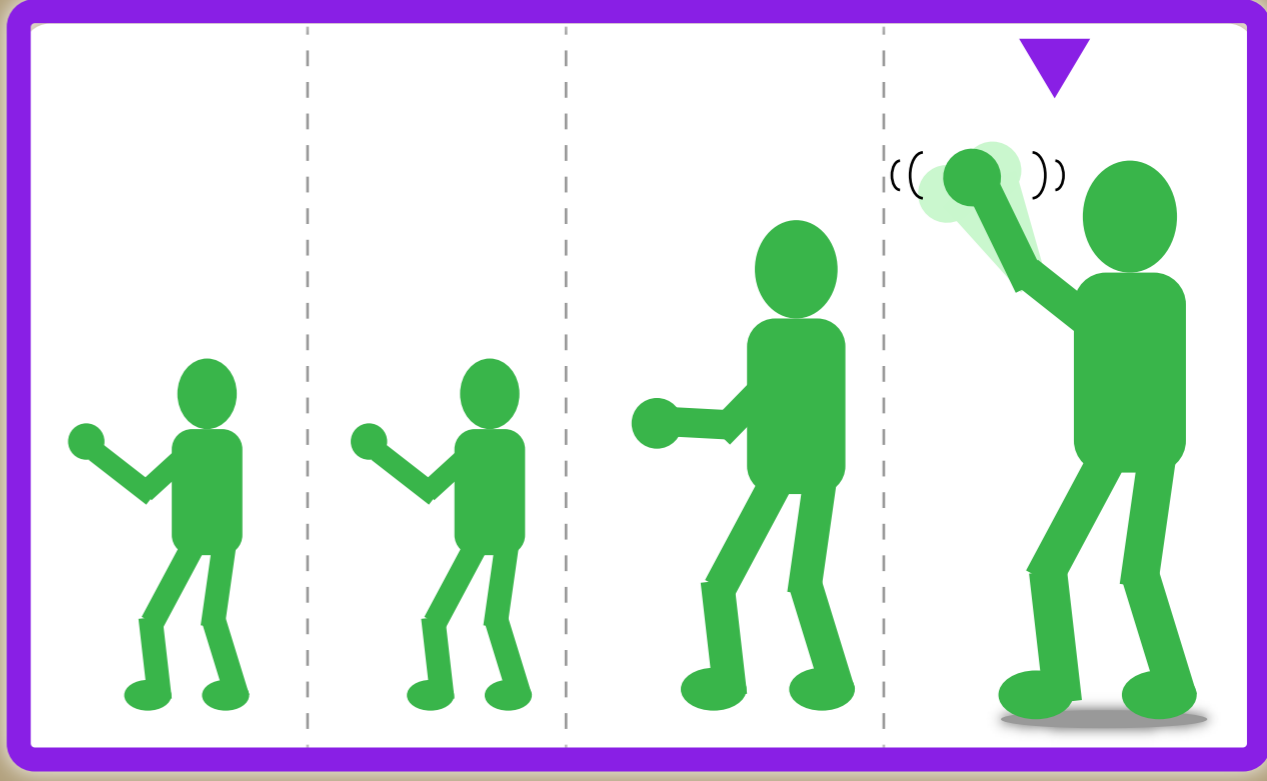
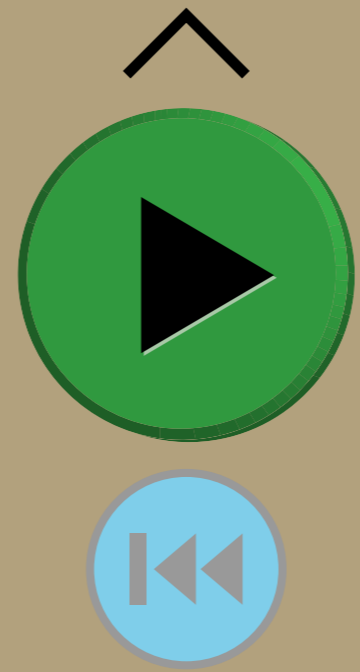
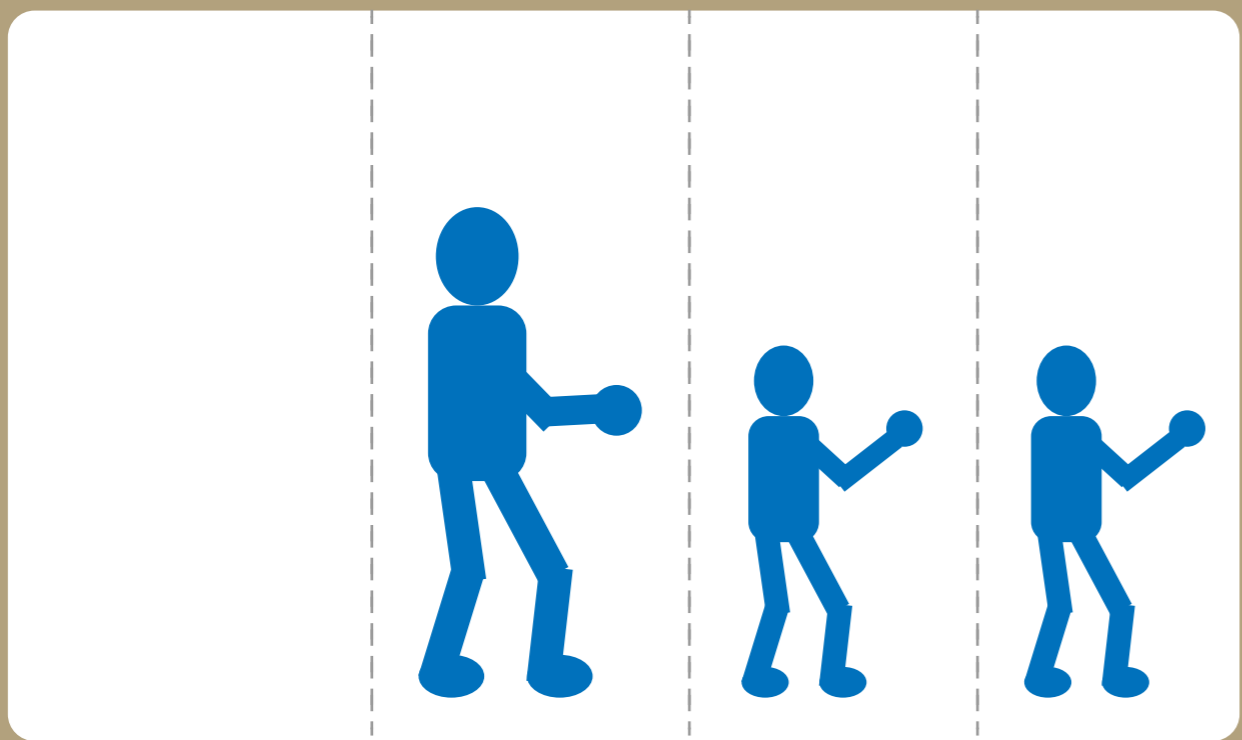
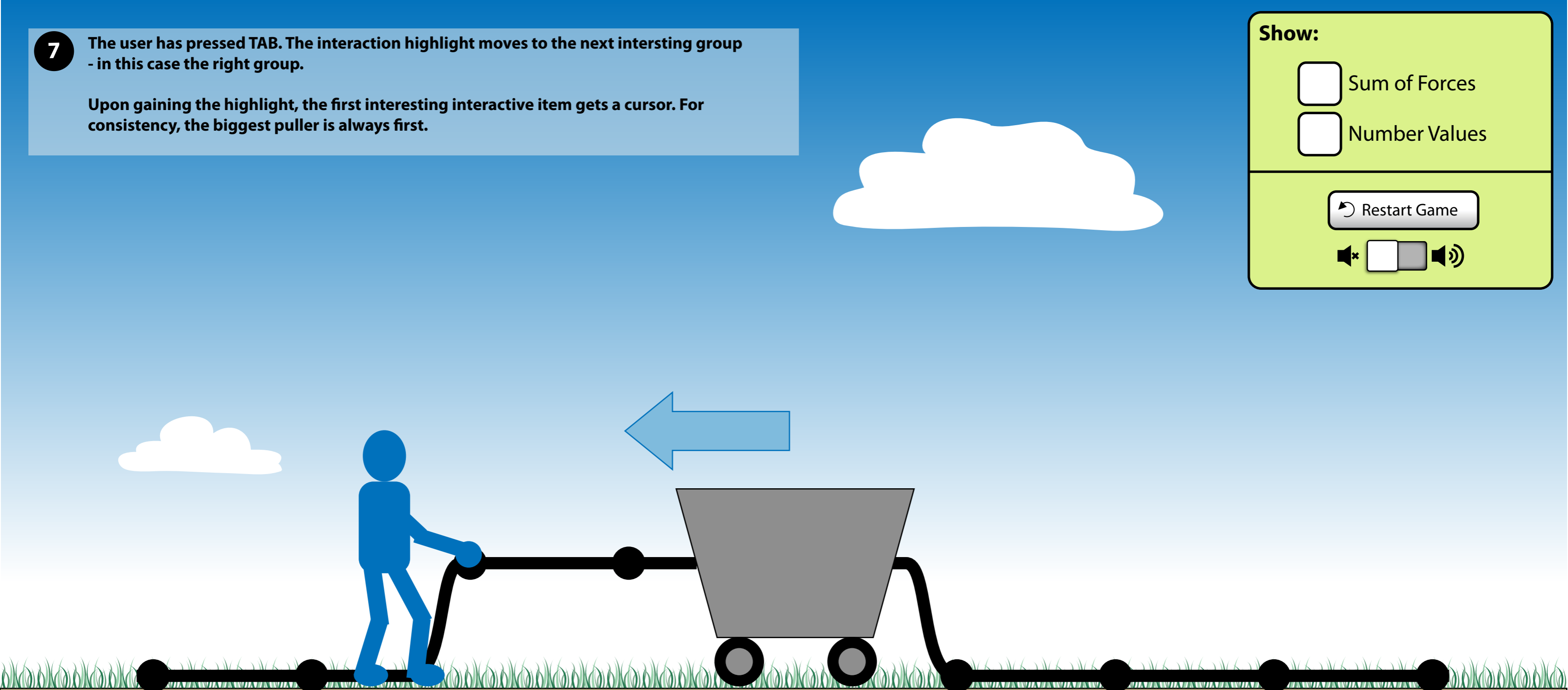
Upon gaining the highlight, the first interesting interactive item gets a cursor. For consistency, the biggest puller is always first.

Show:

- Sum of Forces
- Number Values

Restart Game

Speaker icon with volume slider



8 The user has pressed Enter on the big puller, and the puller pops up above the right rope. The first position is always the unoccupied knot furthest from the cart.

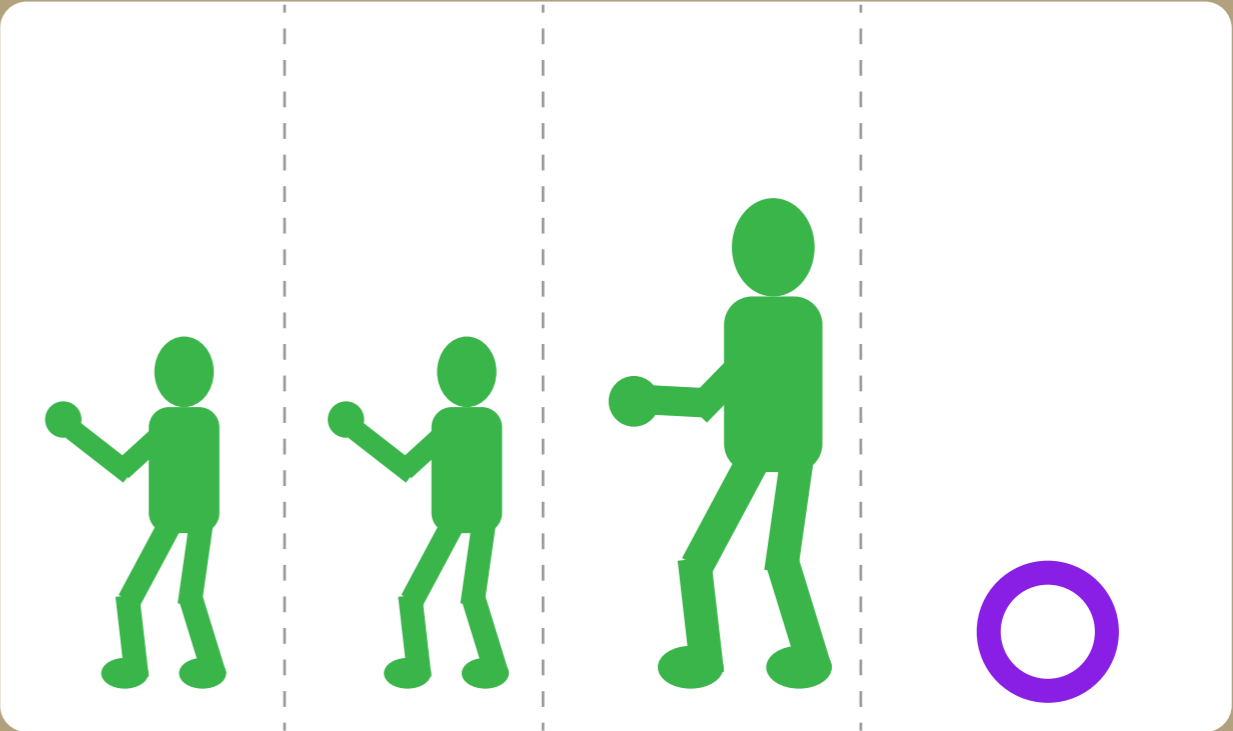
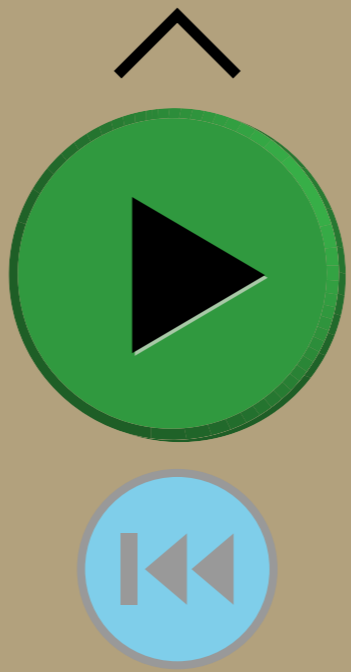
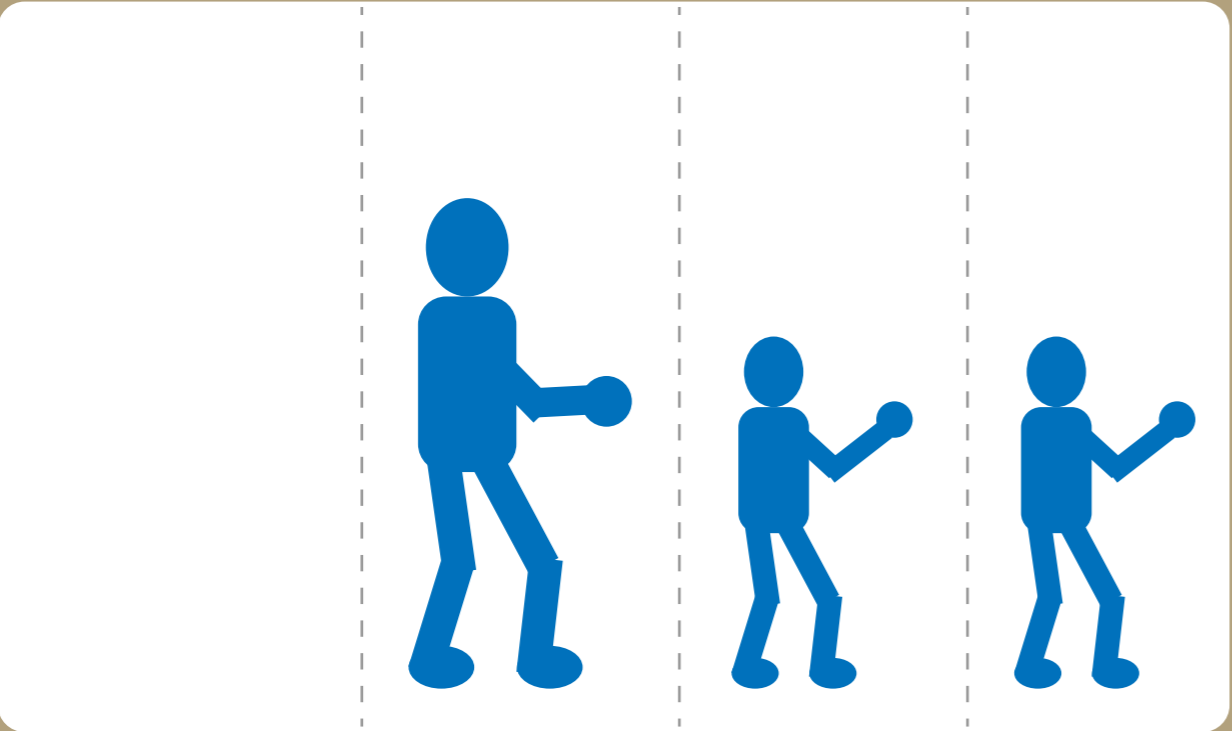
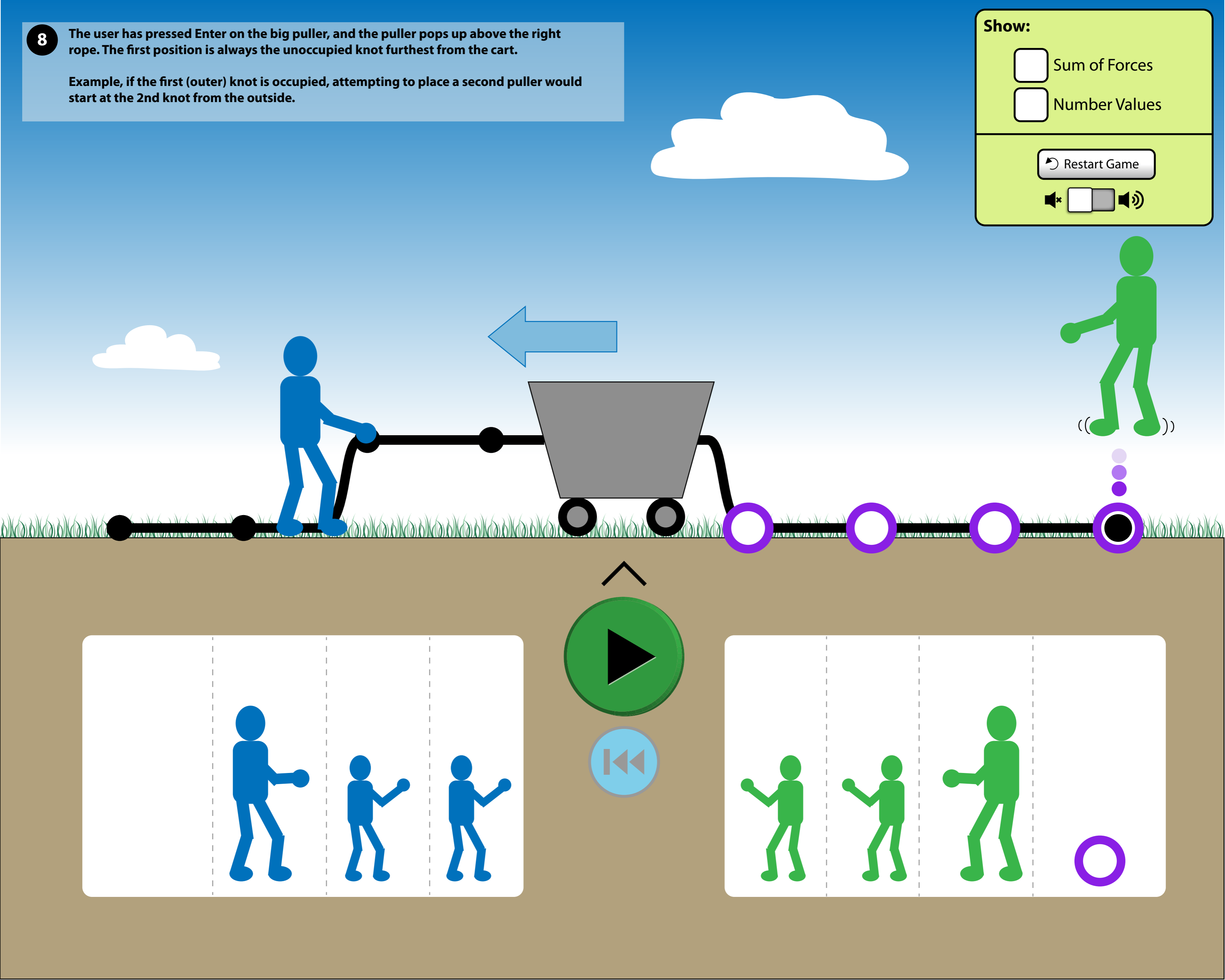
Example, if the first (outer) knot is occupied, attempting to place a second puller would start at the 2nd knot from the outside.

Show:

- Sum of Forces
- Number Values

Restart Game

Speaker icon and volume slider



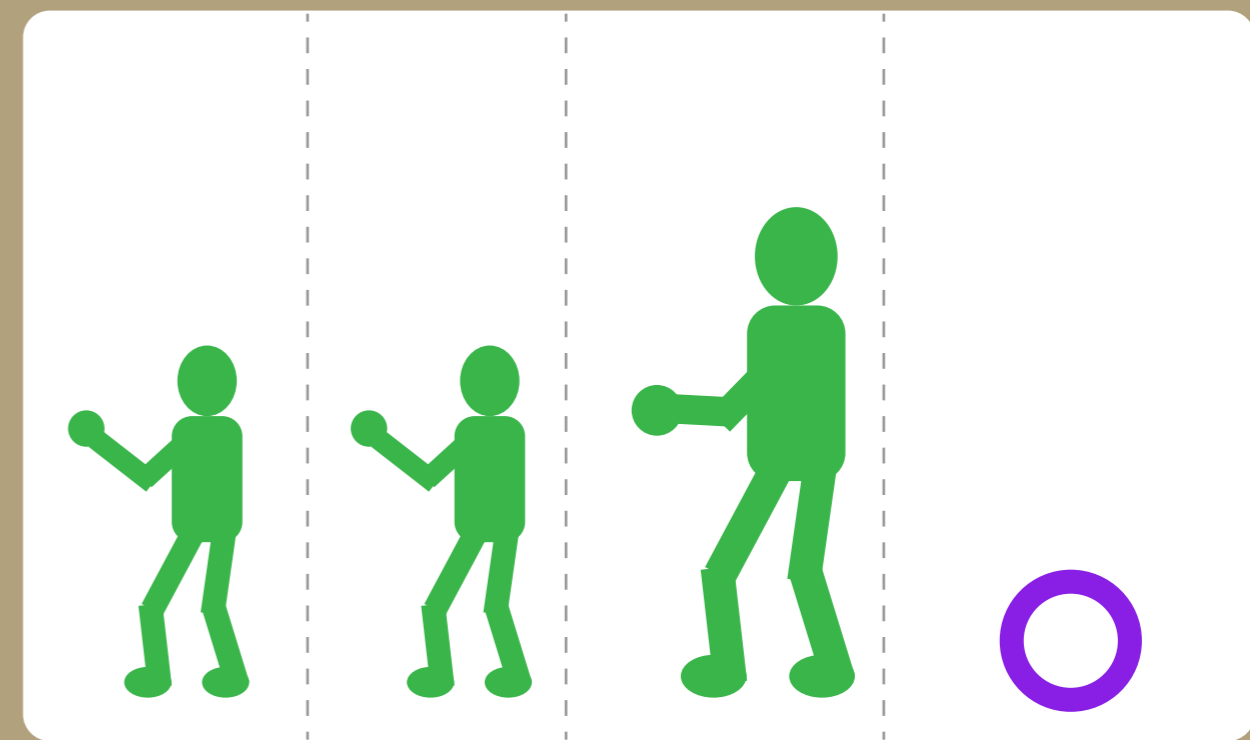
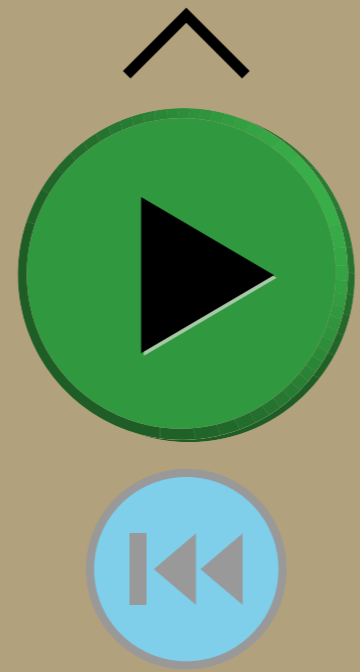
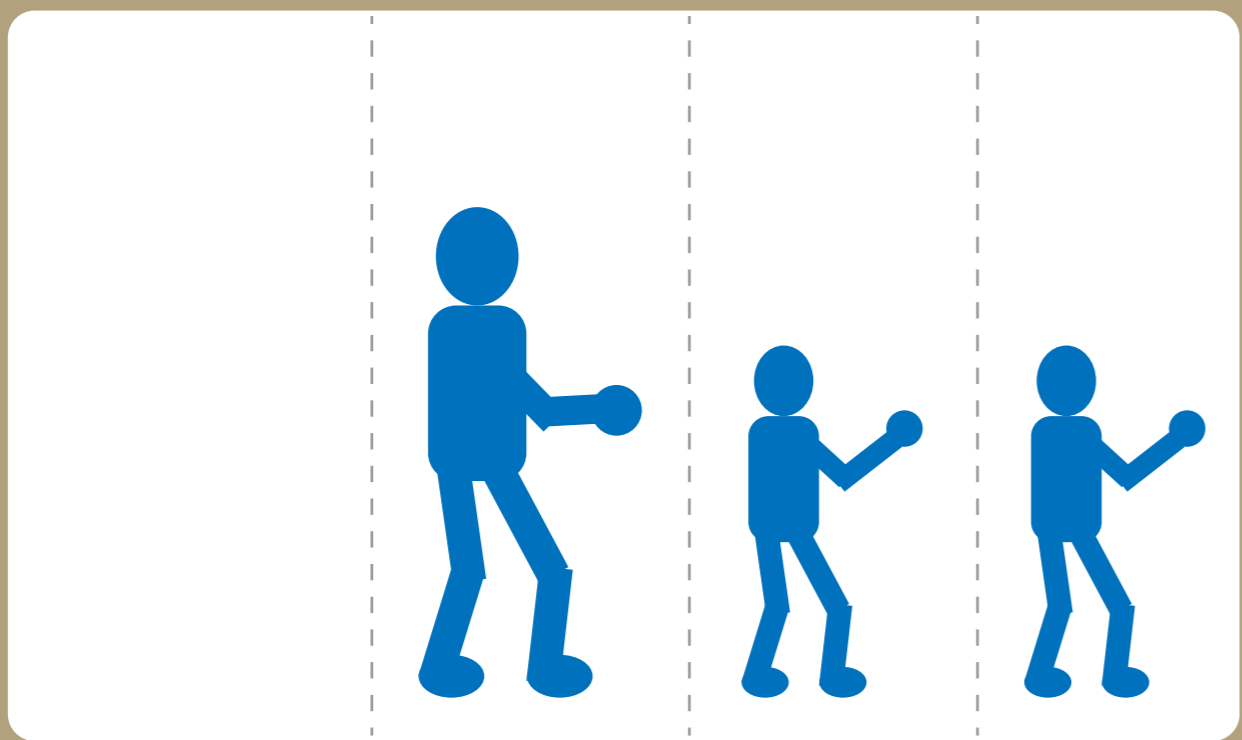
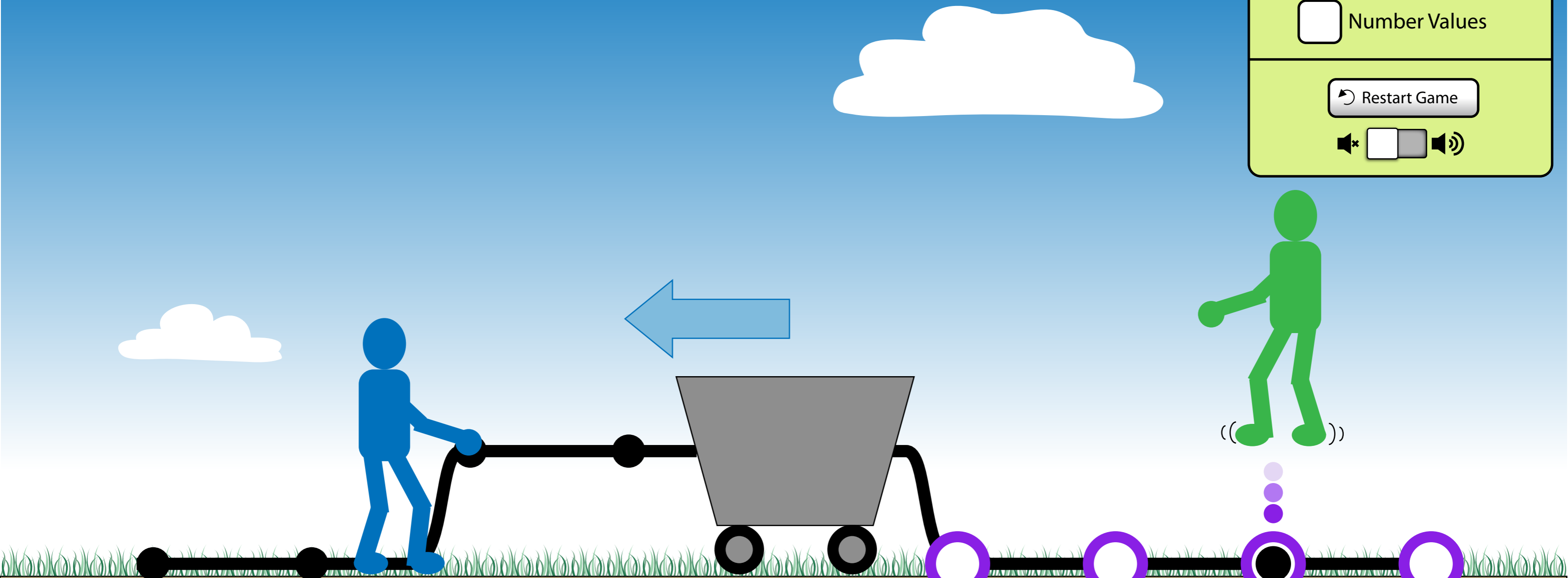
9 The user has moved the puller left 1 spot by pressing the left arrow.

Show:

- Sum of Forces
- Number Values

Restart Game

Speaker icon and volume slider



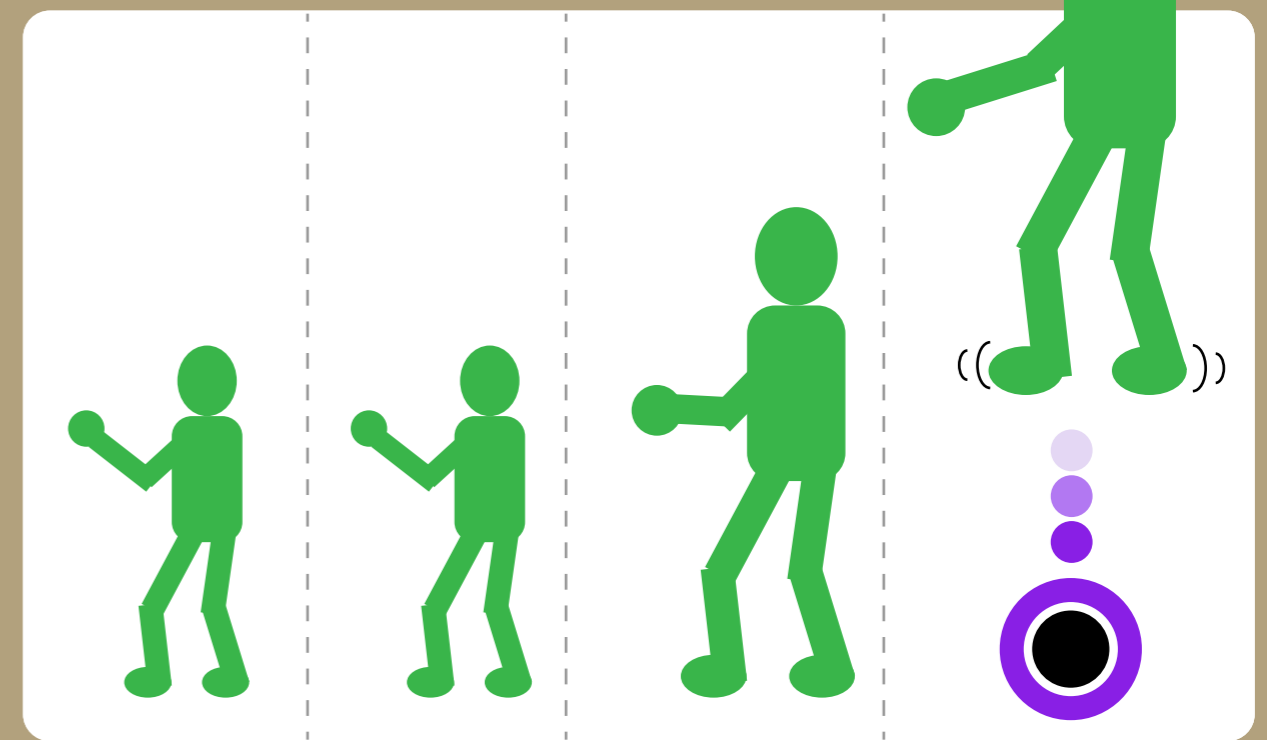
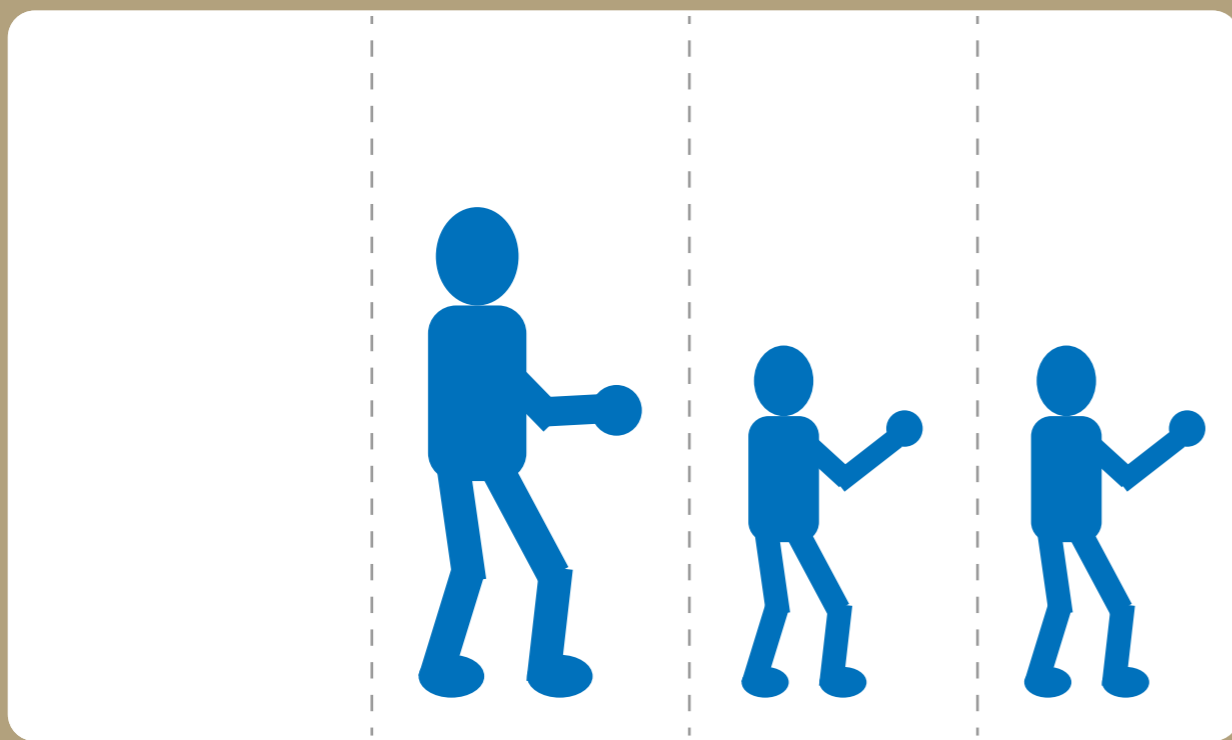
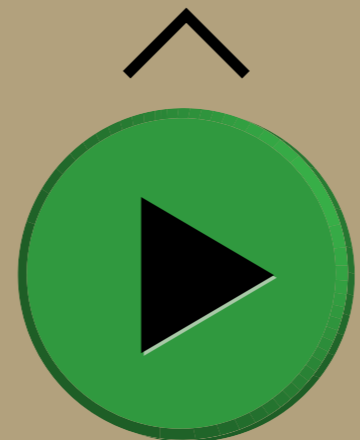
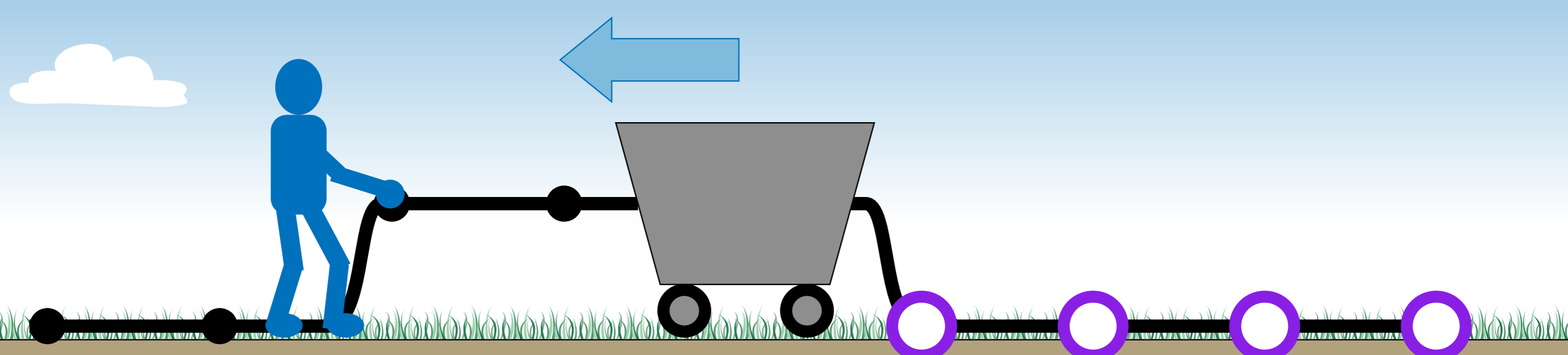
10 The user has pressed the down arrow and the puller pops below the playing area. They could press Enter to put the puller back with their team.

Alternatively the user could have pressed the left arrow key 3 times, or left arrow key 2 times to get the same result.

Show:

- Sum of Forces
- Number Values

Restart Game



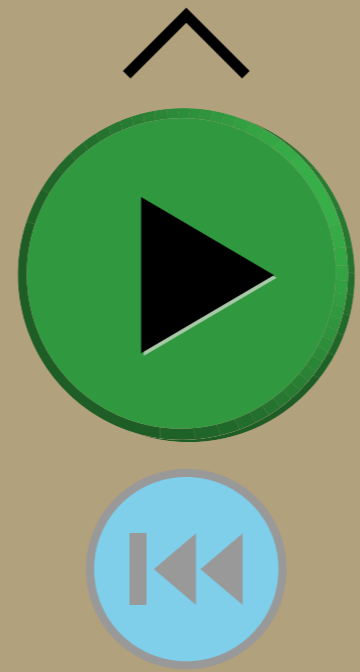
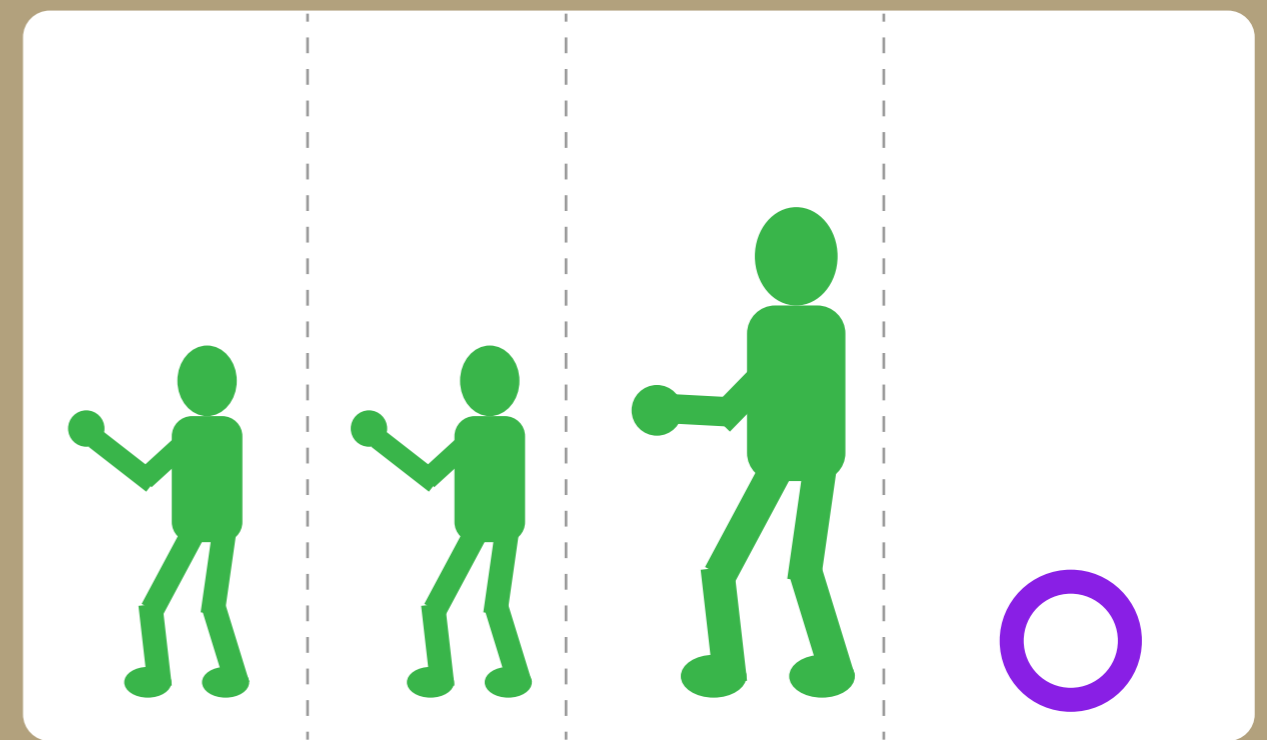
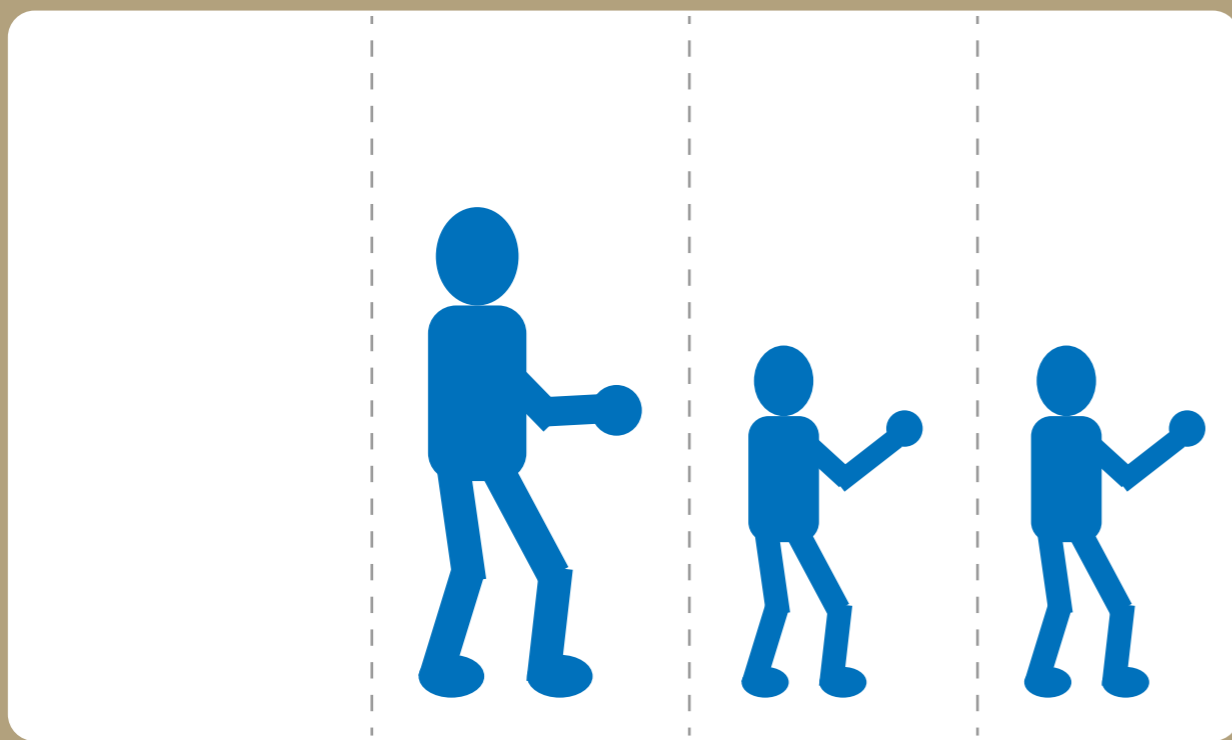
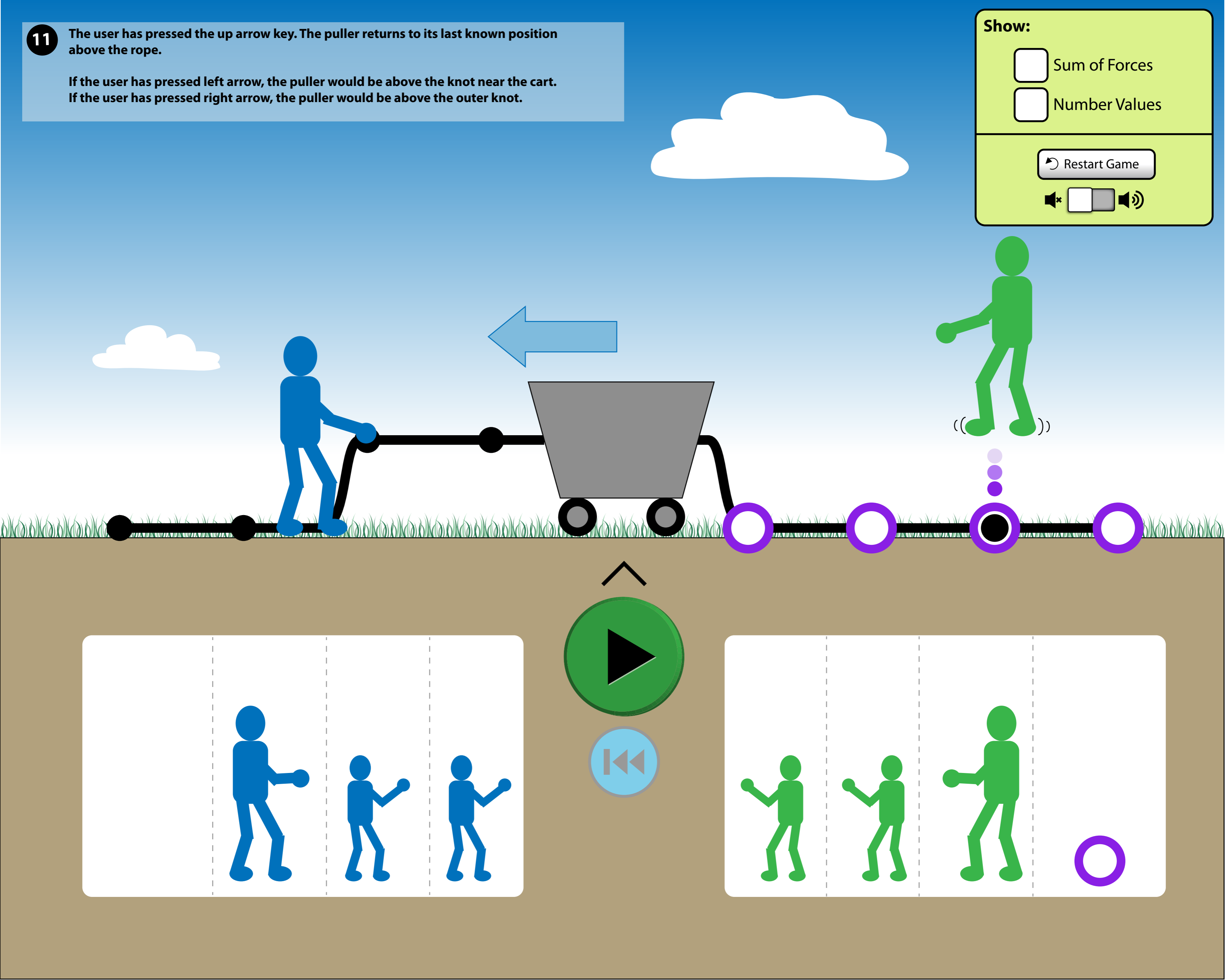
11 The user has pressed the up arrow key. The puller returns to its last known position above the rope.

If the user has pressed left arrow, the puller would be above the knot near the cart.
If the user has pressed right arrow, the puller would be above the outer knot.

Show:

- Sum of Forces
- Number Values

Restart Game



12

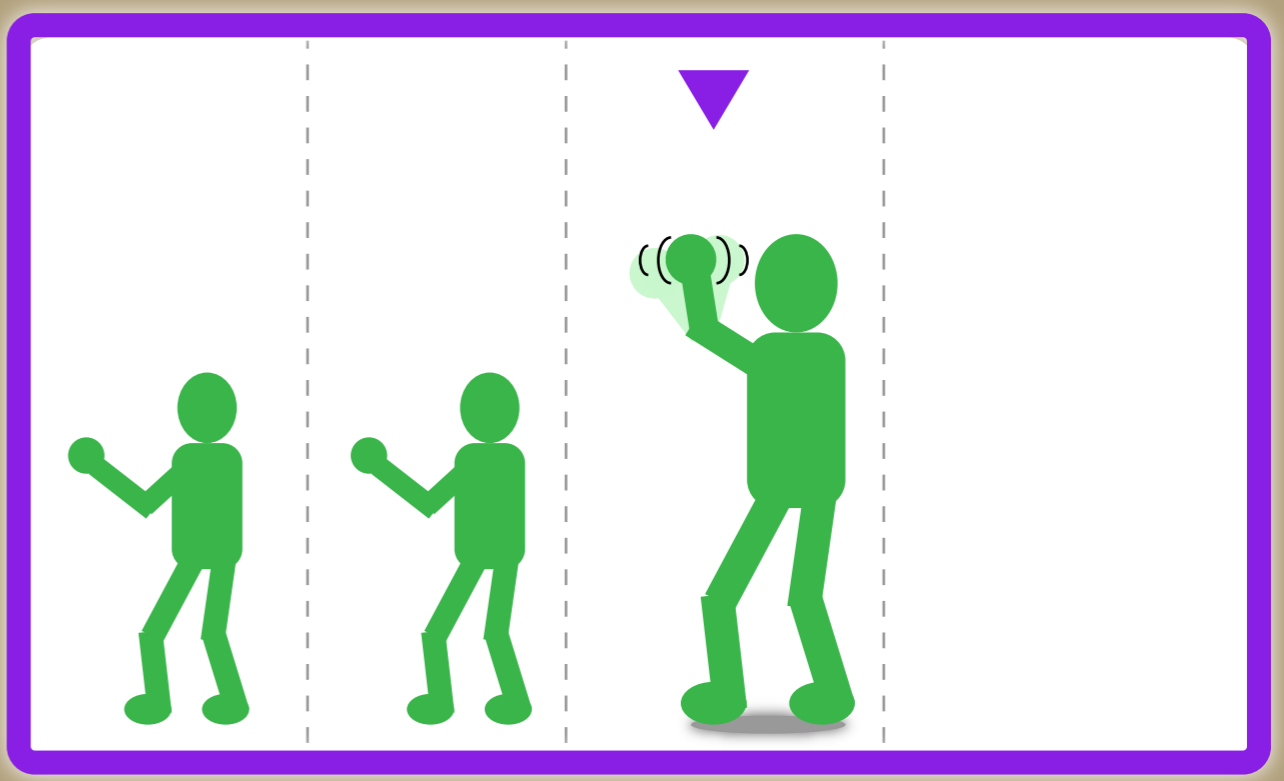
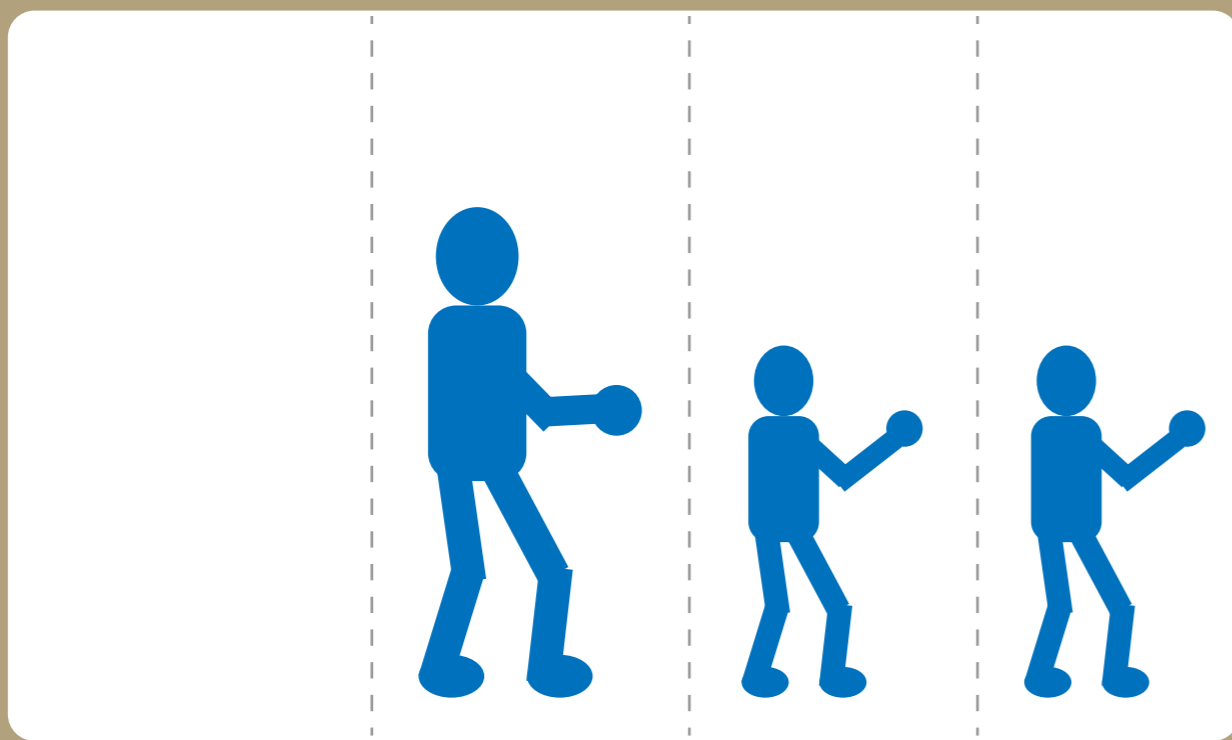
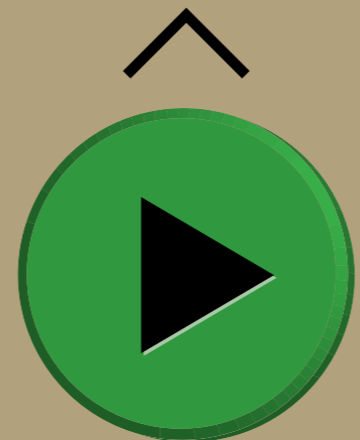
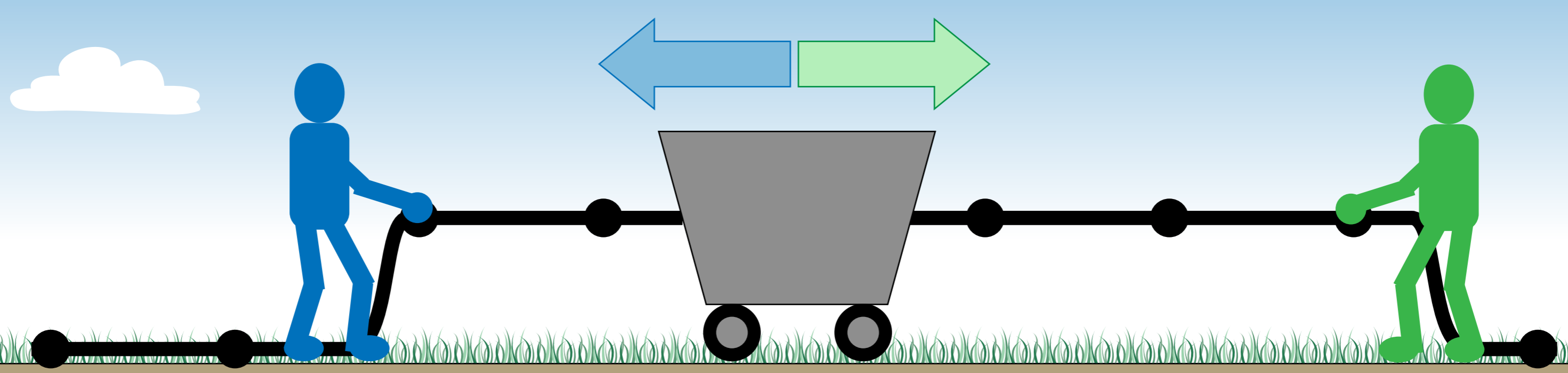
The user has pressed Enter to set the puller in place.

The cursor and interaction highlight returns to the right team.

Show:

- Sum of Forces
- Number Values

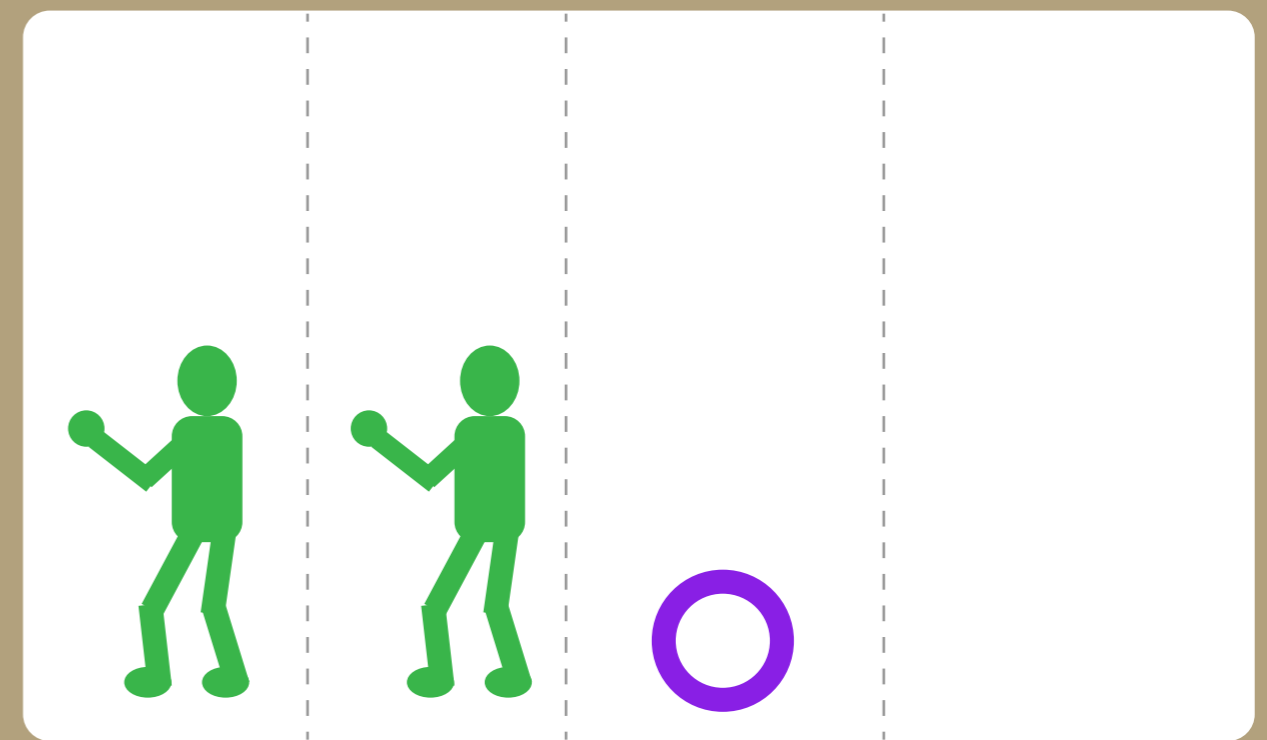
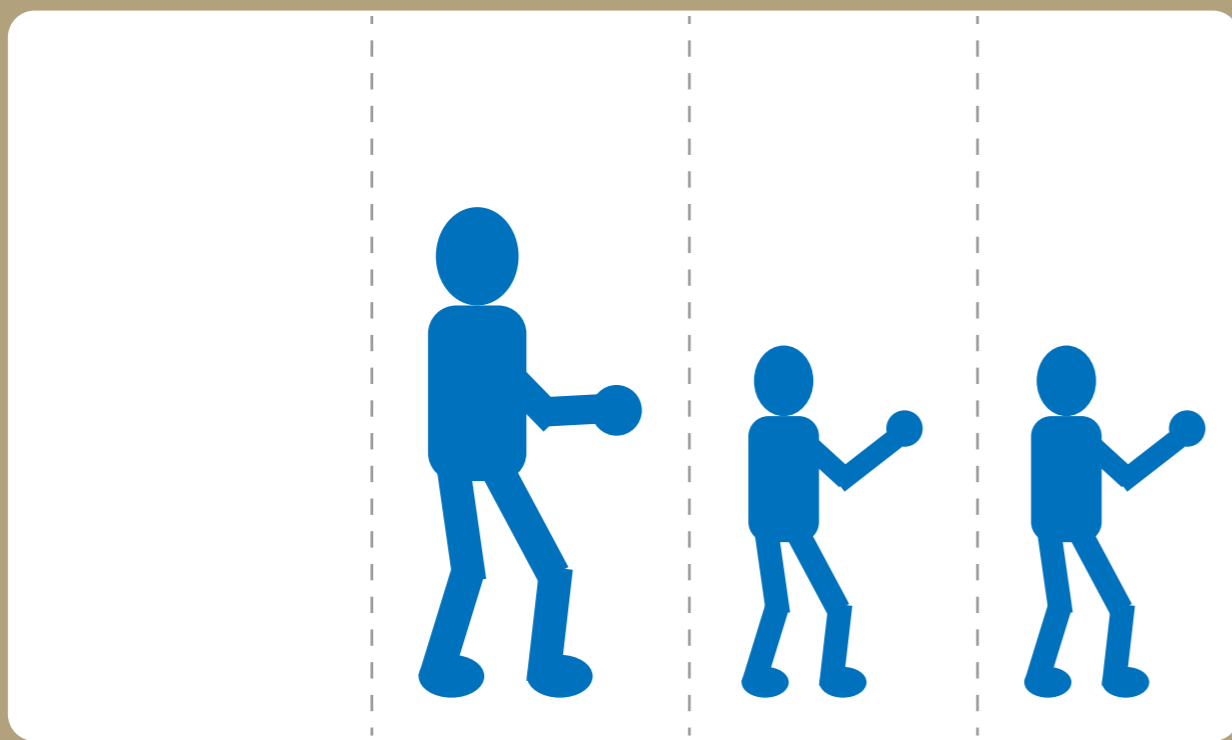
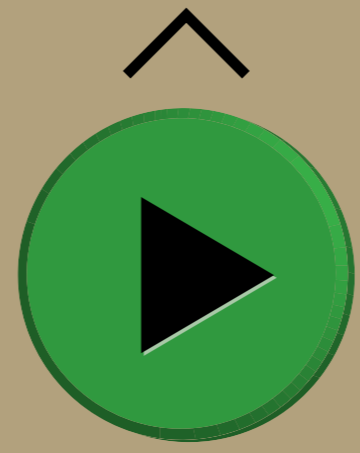
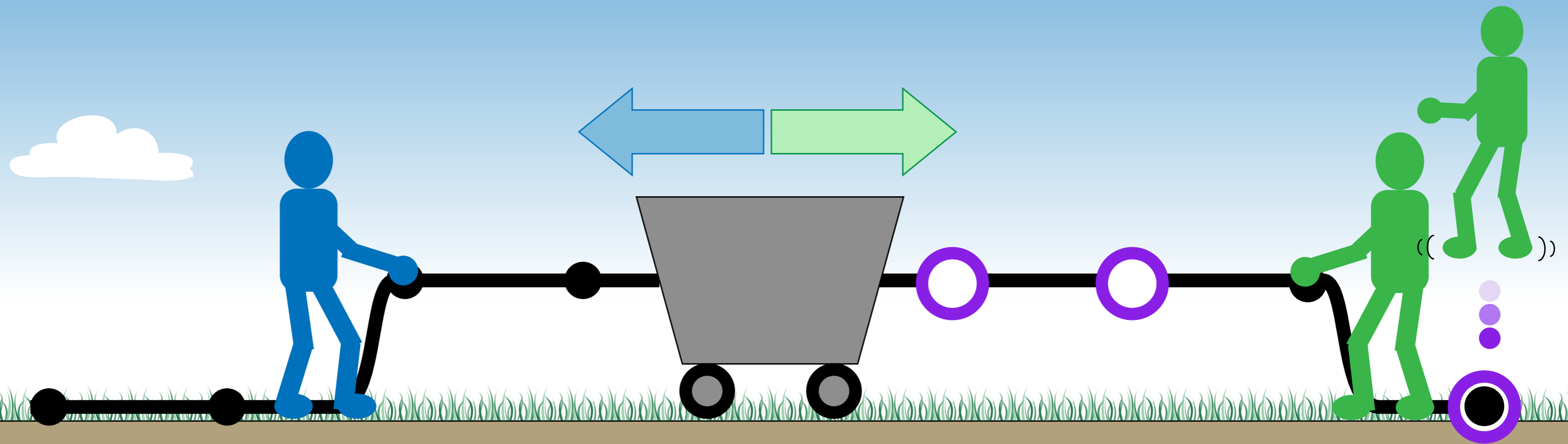
Restart Game



13 The user has pressed the Enter key, and the next puller appears above the first available knot .

- Show:
- Sum of Forces
 - Number Values

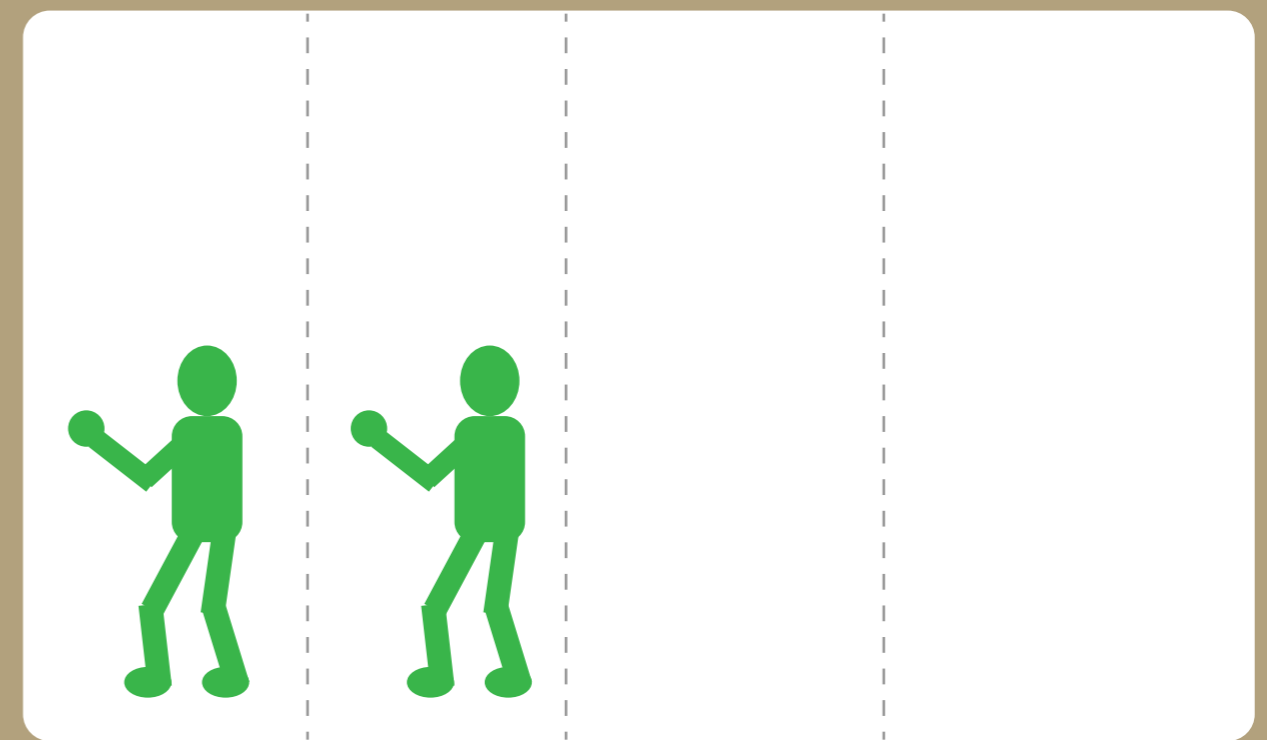
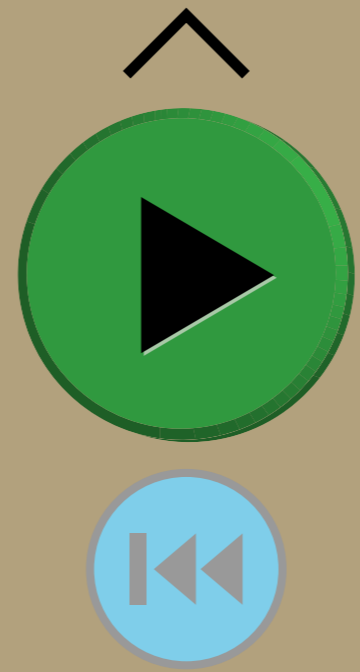
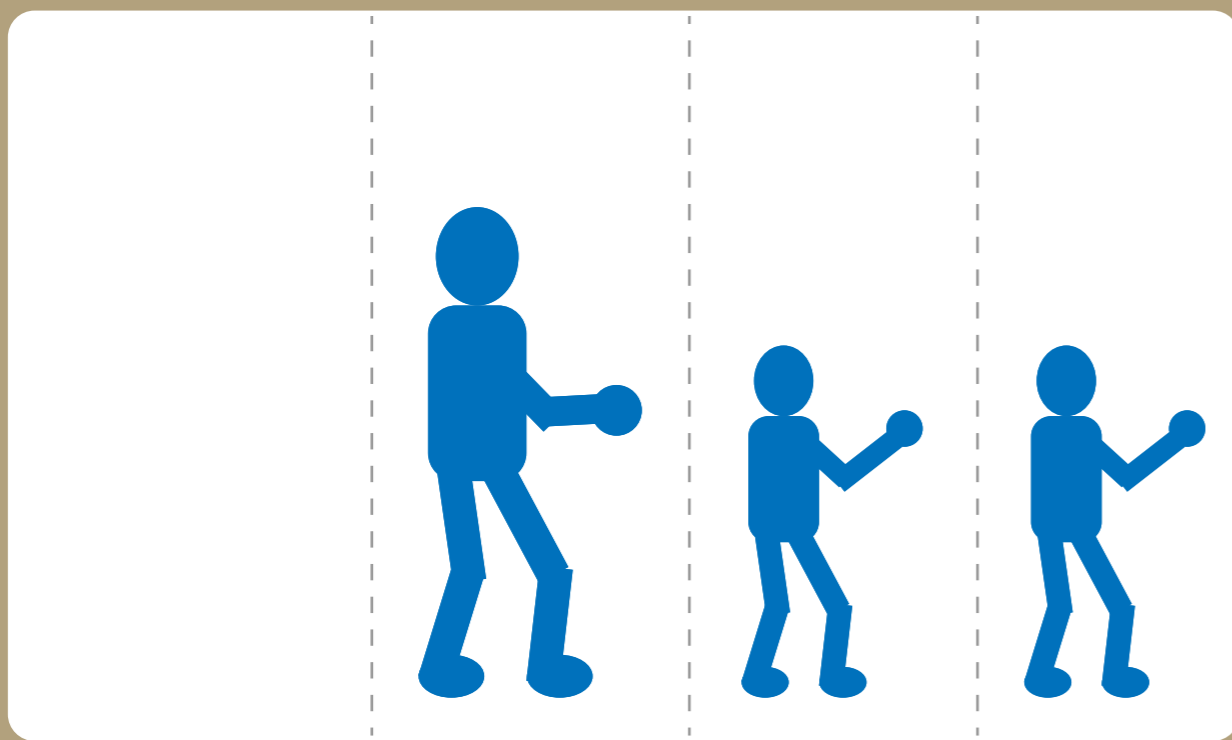
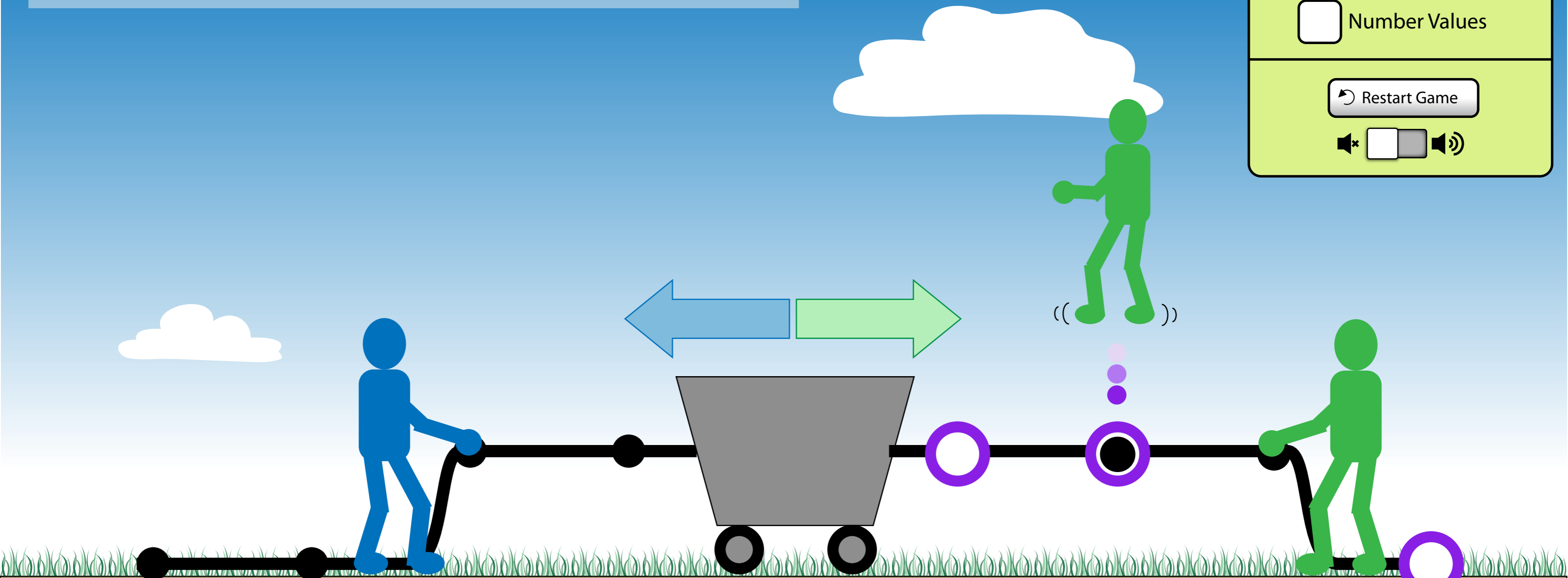
Restart Game



14 The user has pressed the left arrow key. The puller skips over the occupied spot to the 2nd spot closest to the cart.

Show:
 Sum of Forces
 Number Values

Restart Game



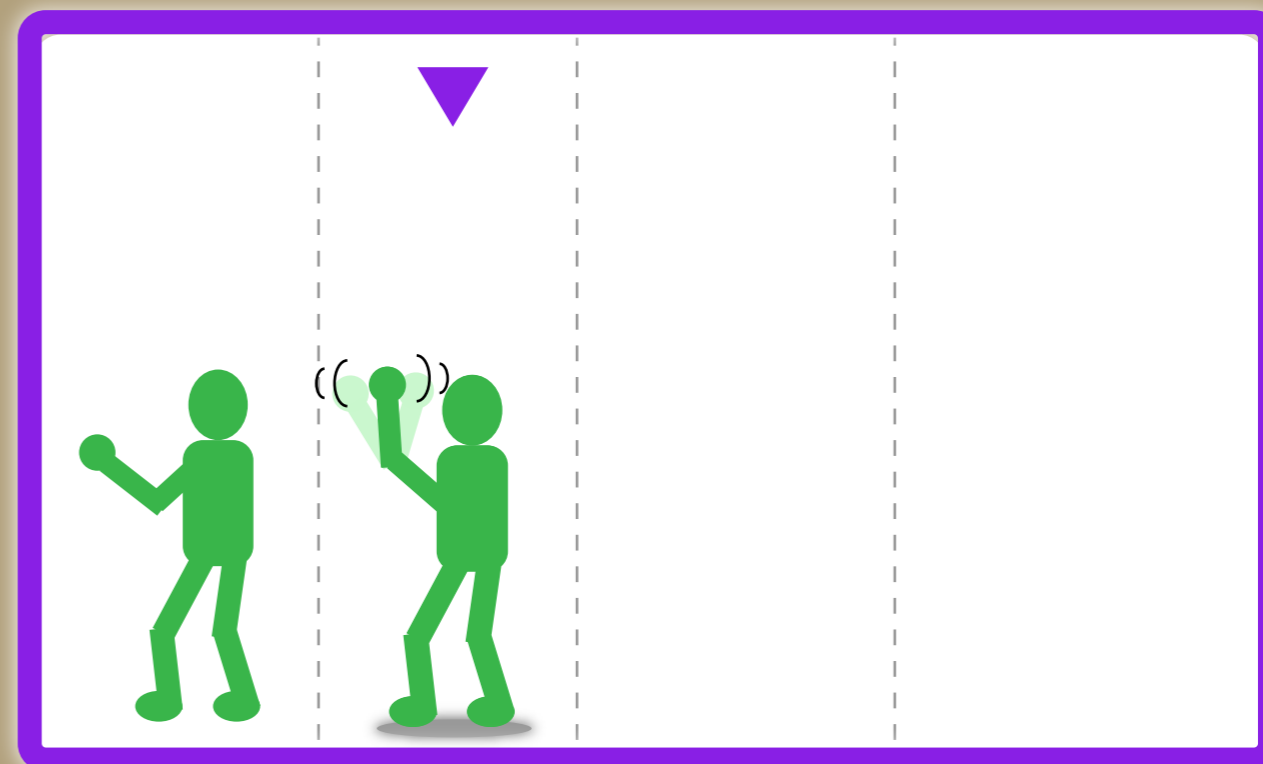
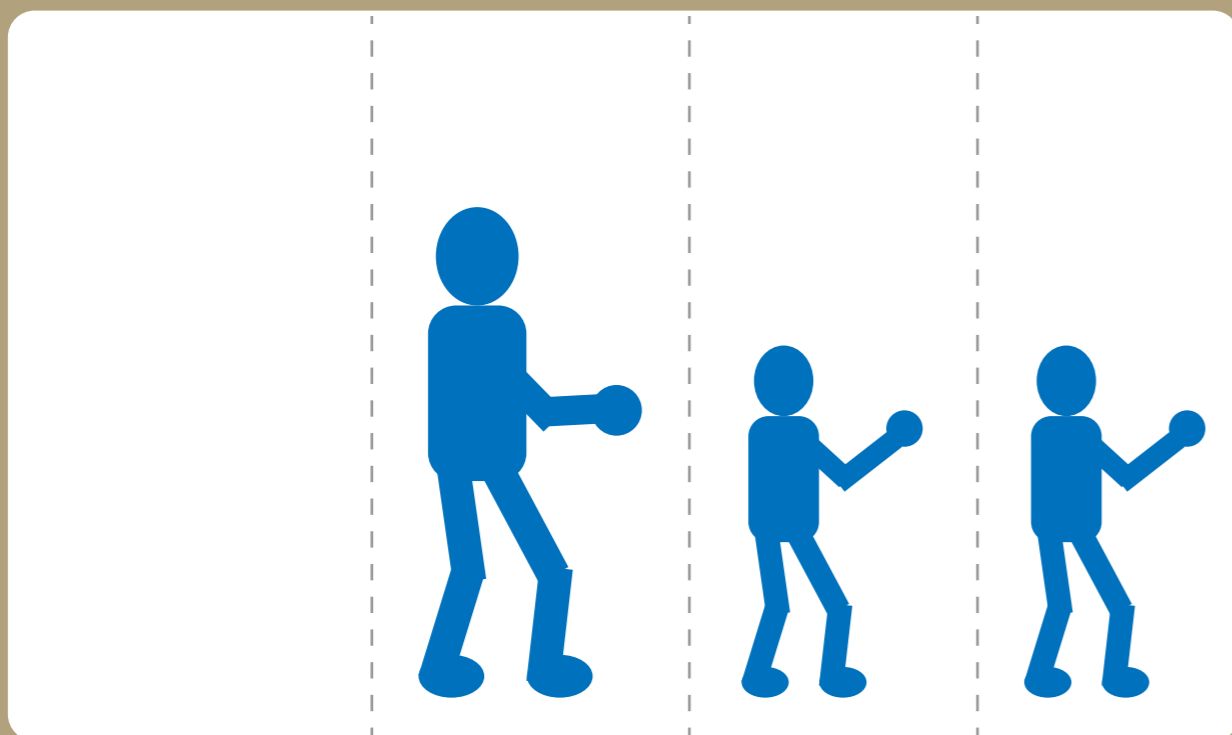
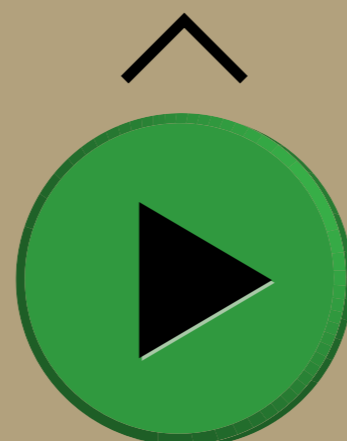
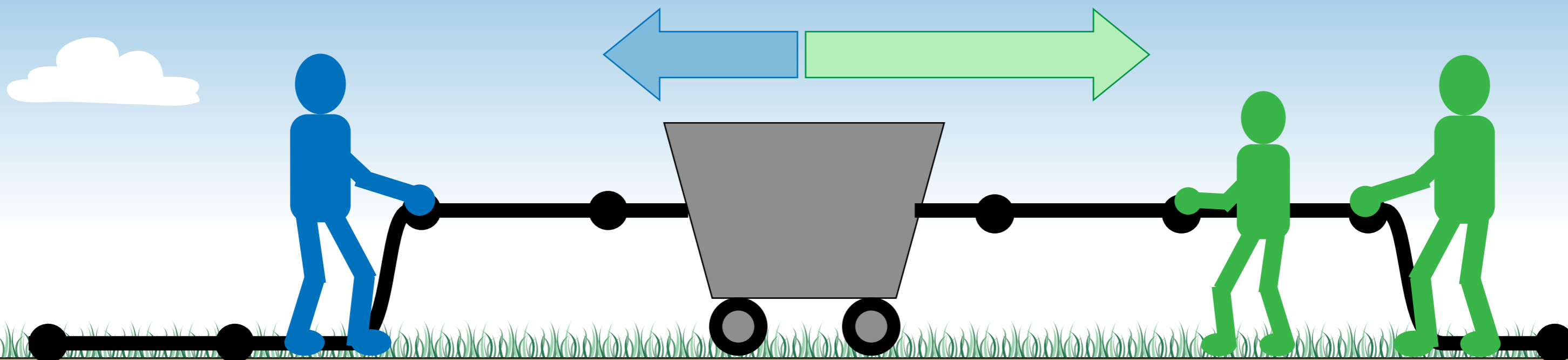
15

The user has pressed Enter to set the puller in place.

Show:

- Sum of Forces
- Number Values

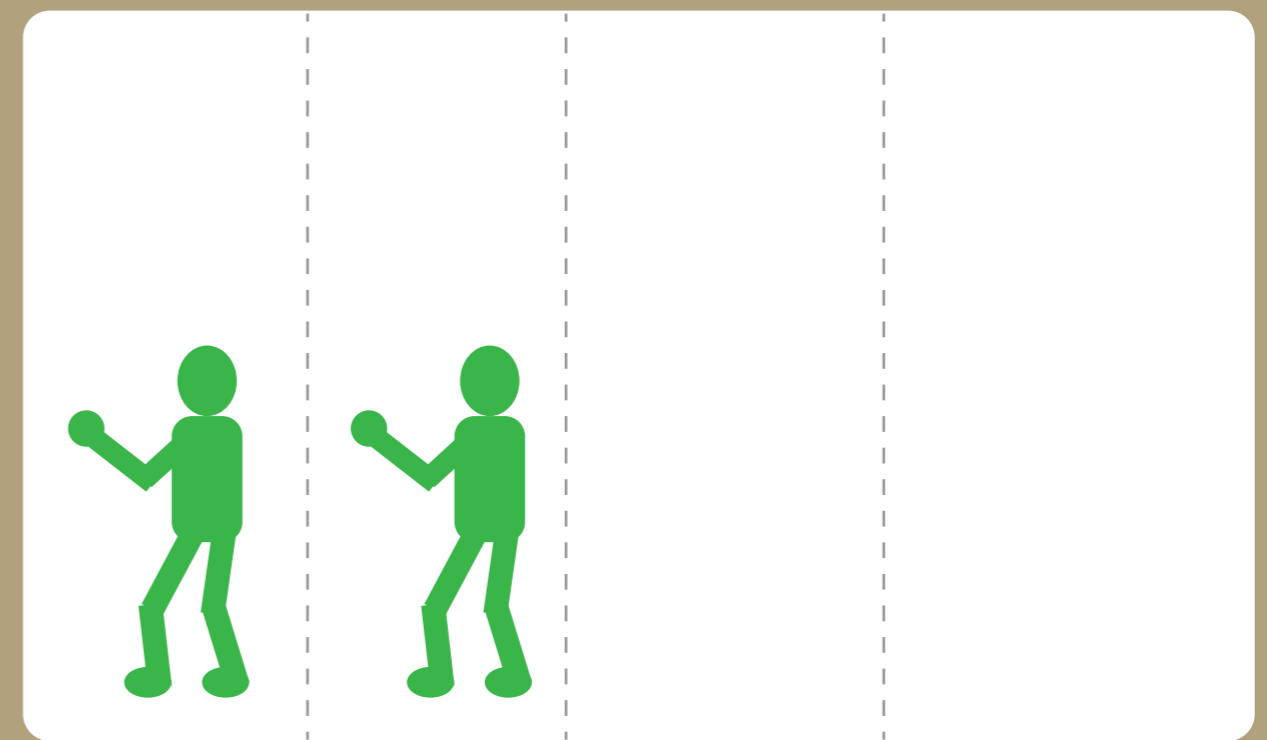
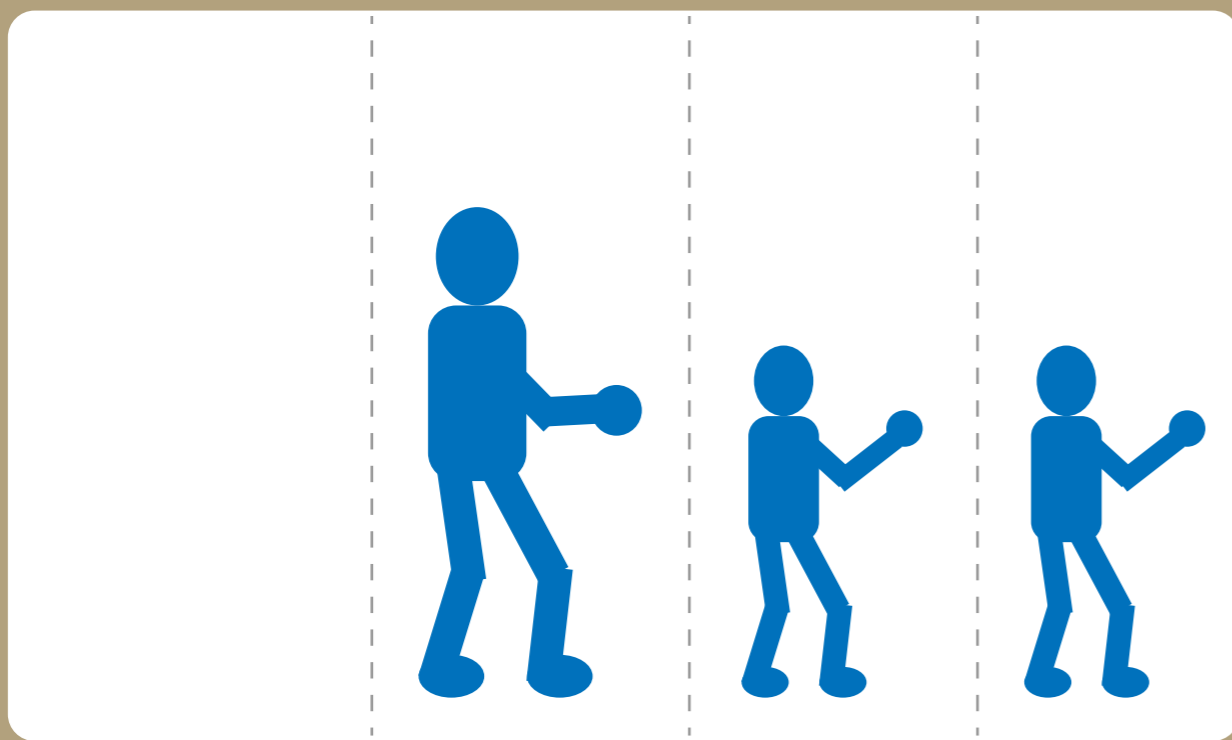
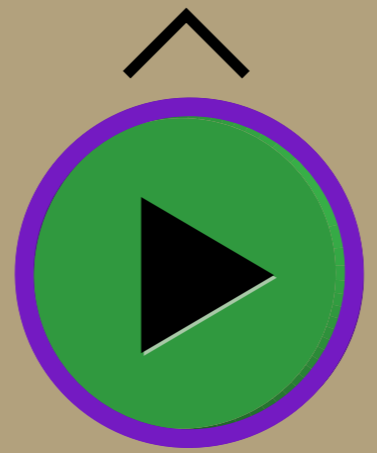
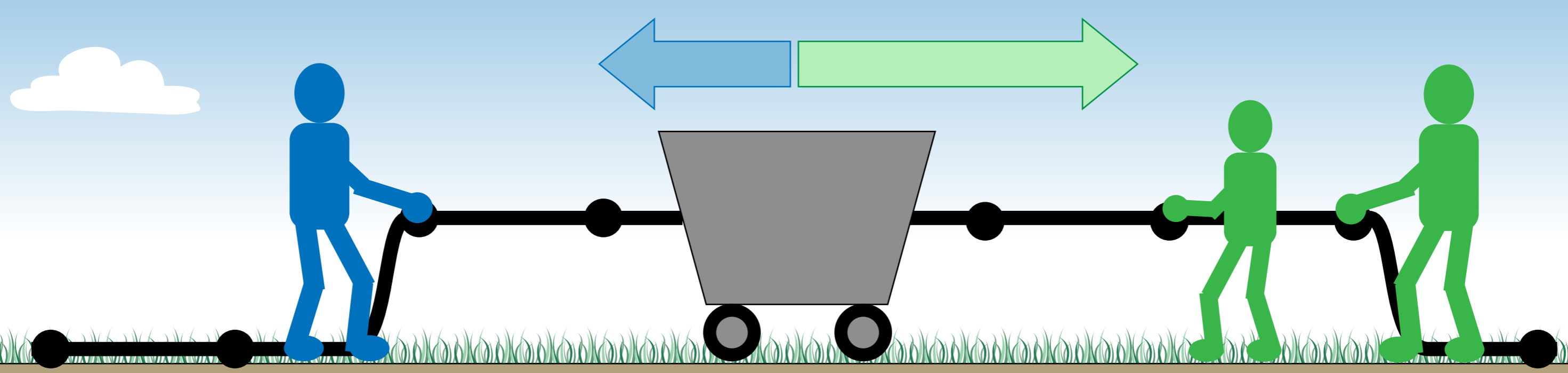
Restart Game



16 The user has pressed Tab, and the highlight appears around the Play button.

- Show:
- Sum of Forces
 - Number Values

Restart Game



17 The user has activated the Play button by pressing Enter. The simulation begins.

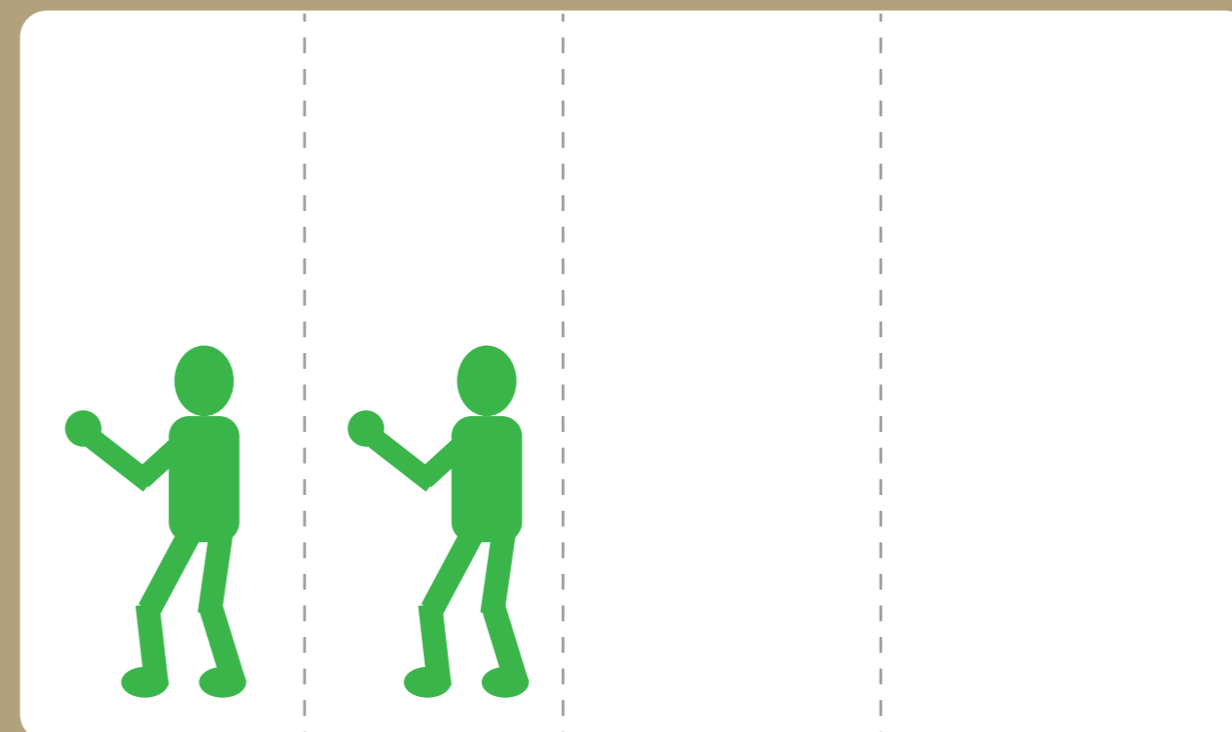
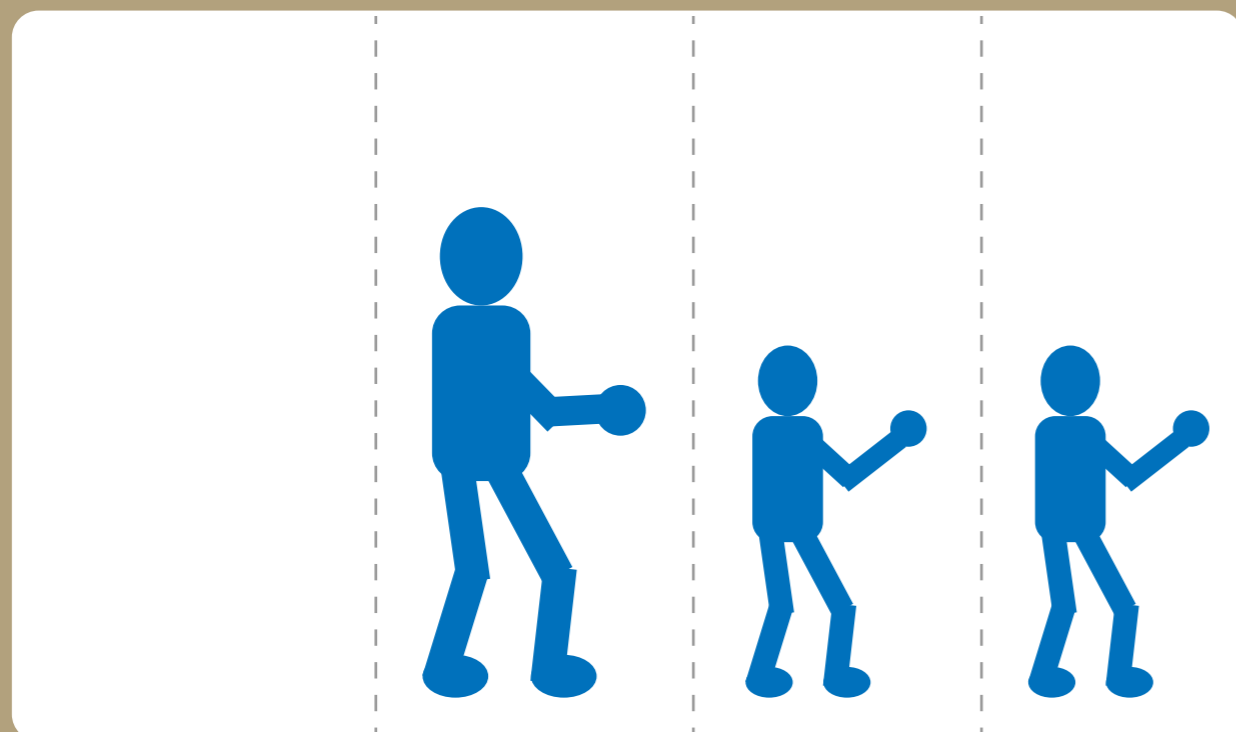
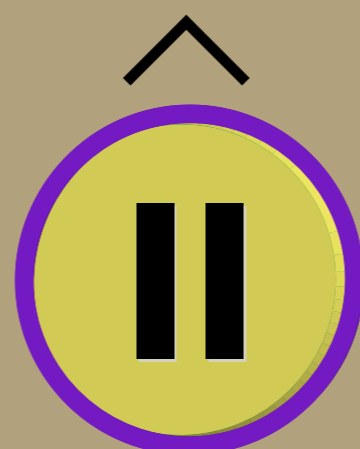
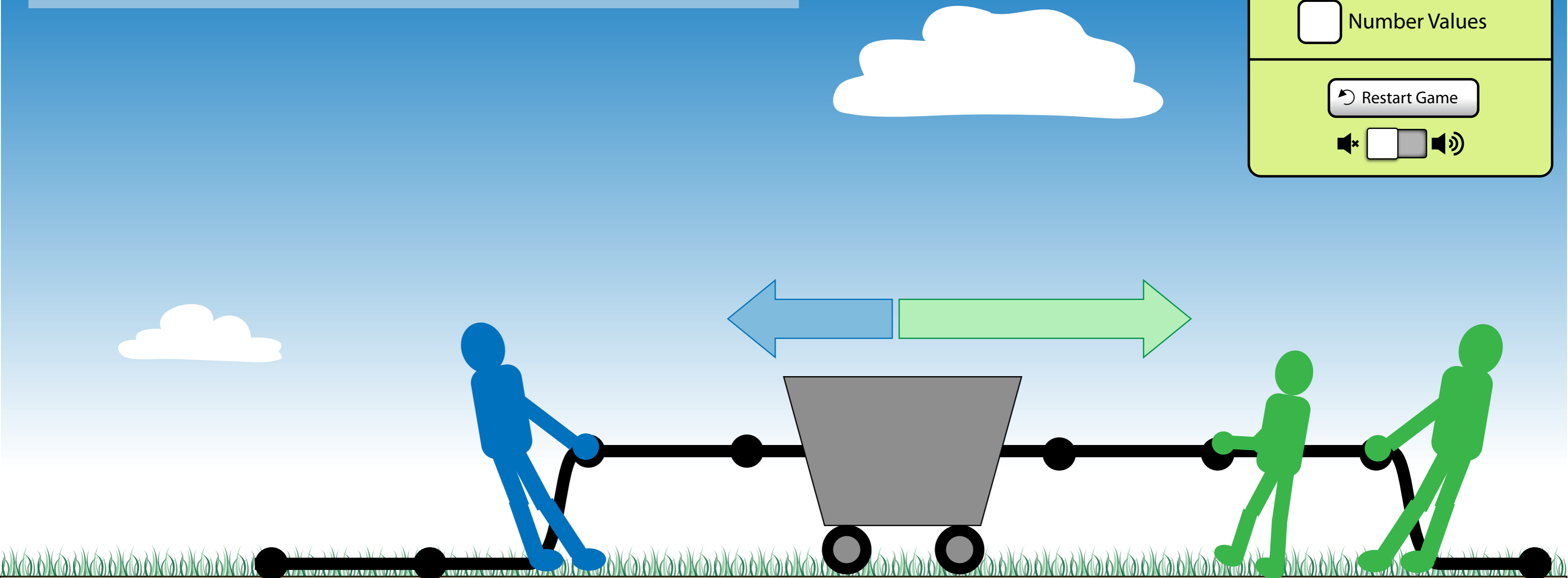
The Play button turns into a Pause button, and the Rewind button becomes enabled.

Show:

Sum of Forces

Number Values

 Restart Game

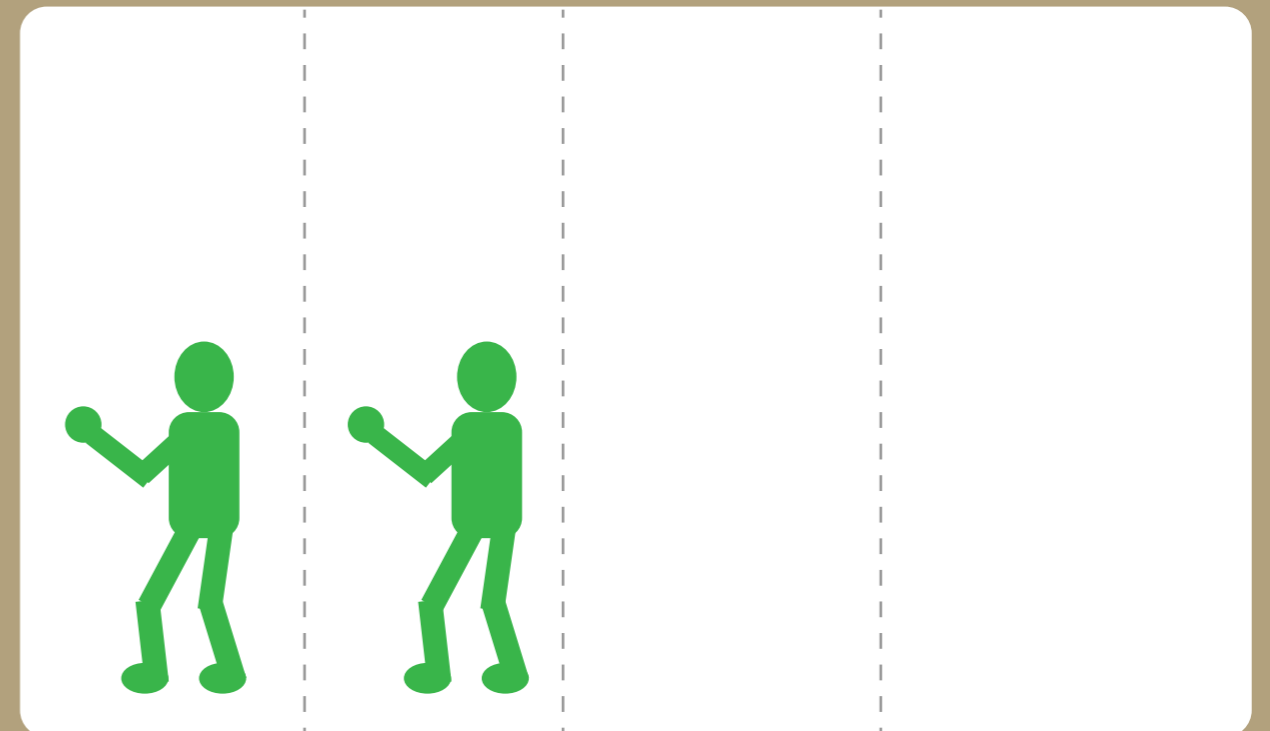
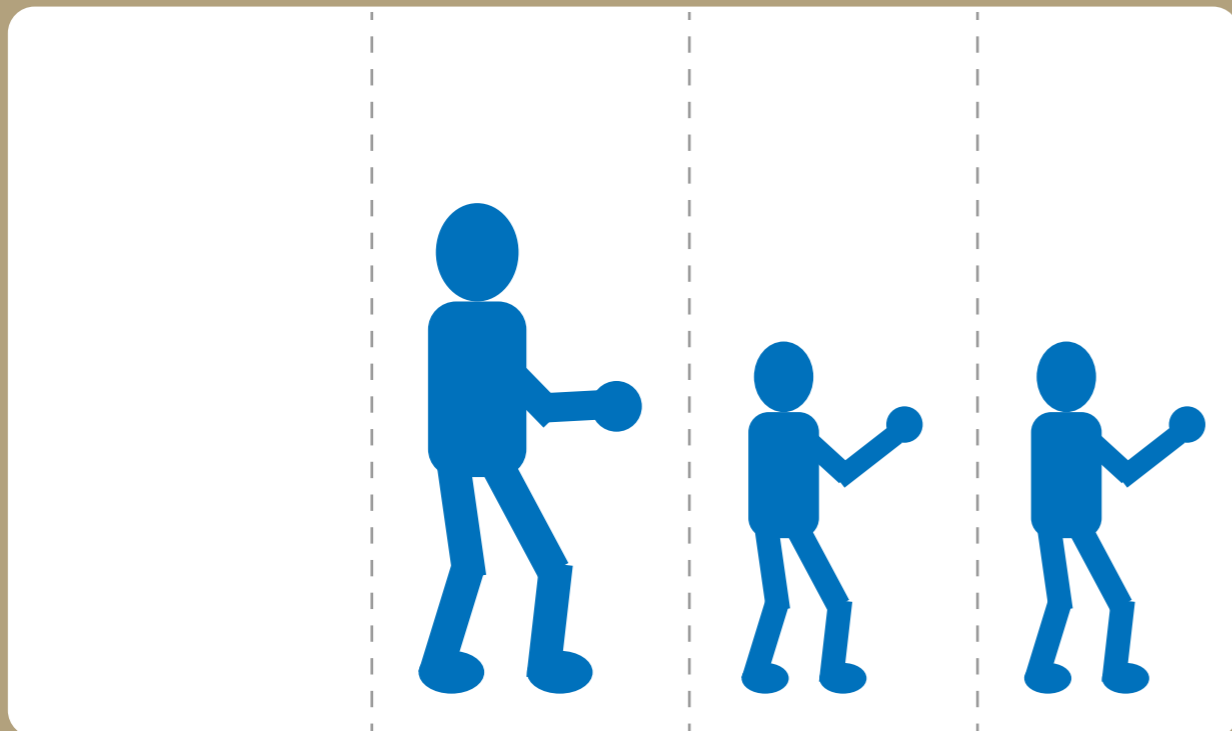
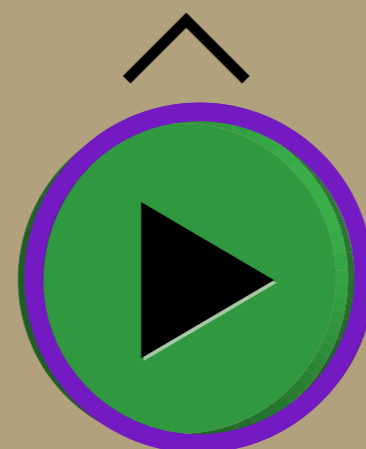
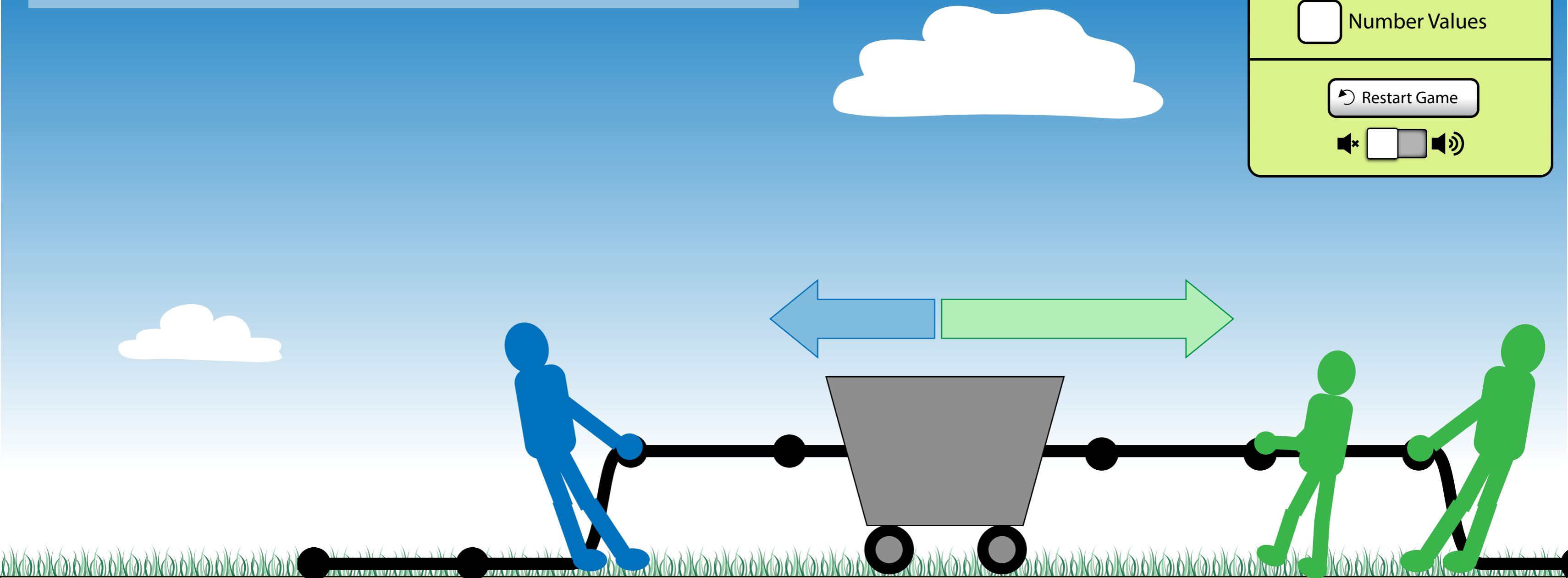


18 The user has activated the Pause button by pressing Enter. The pause button has turned back into the Play button.

Show:

- Sum of Forces
- Number Values

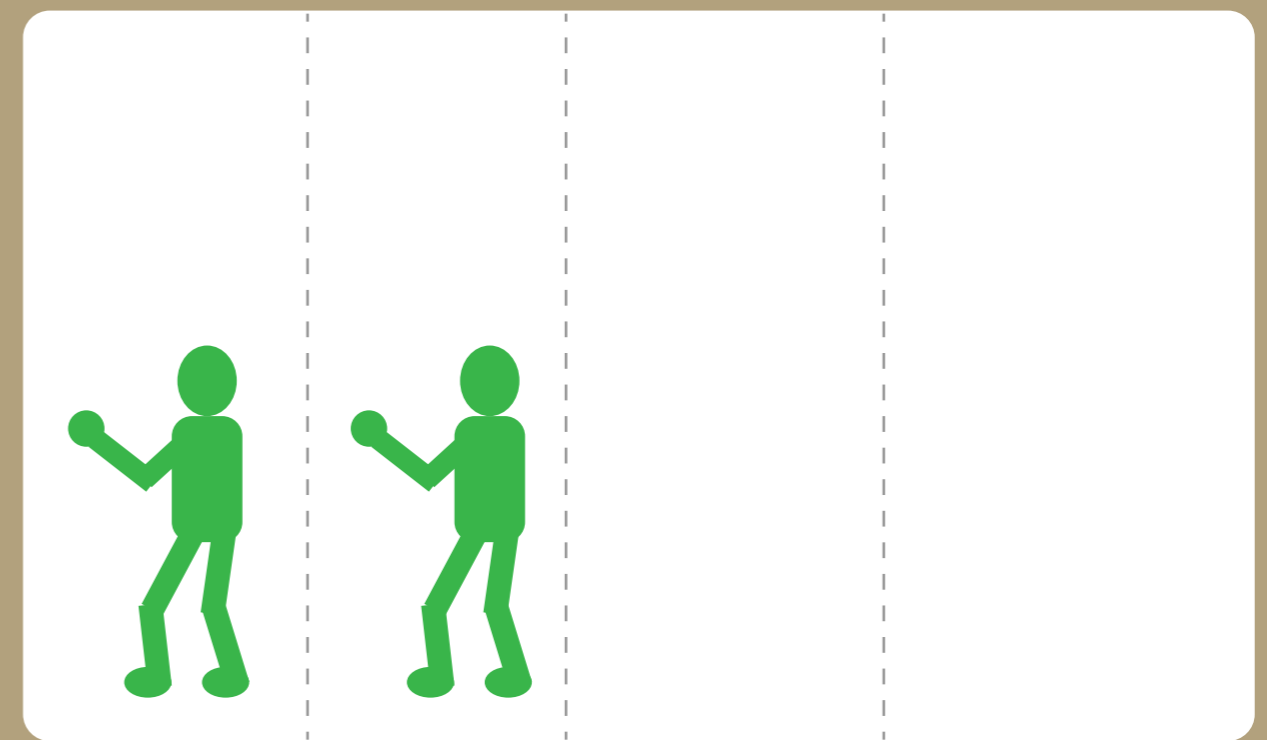
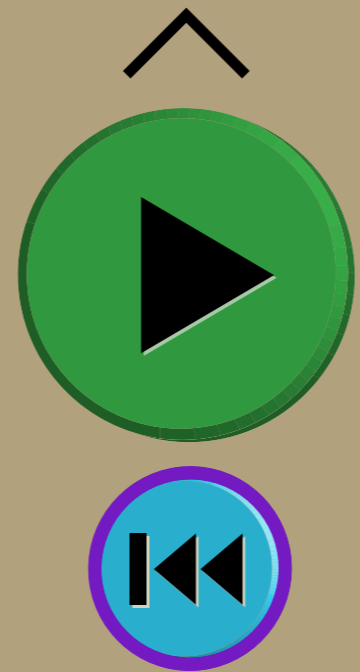
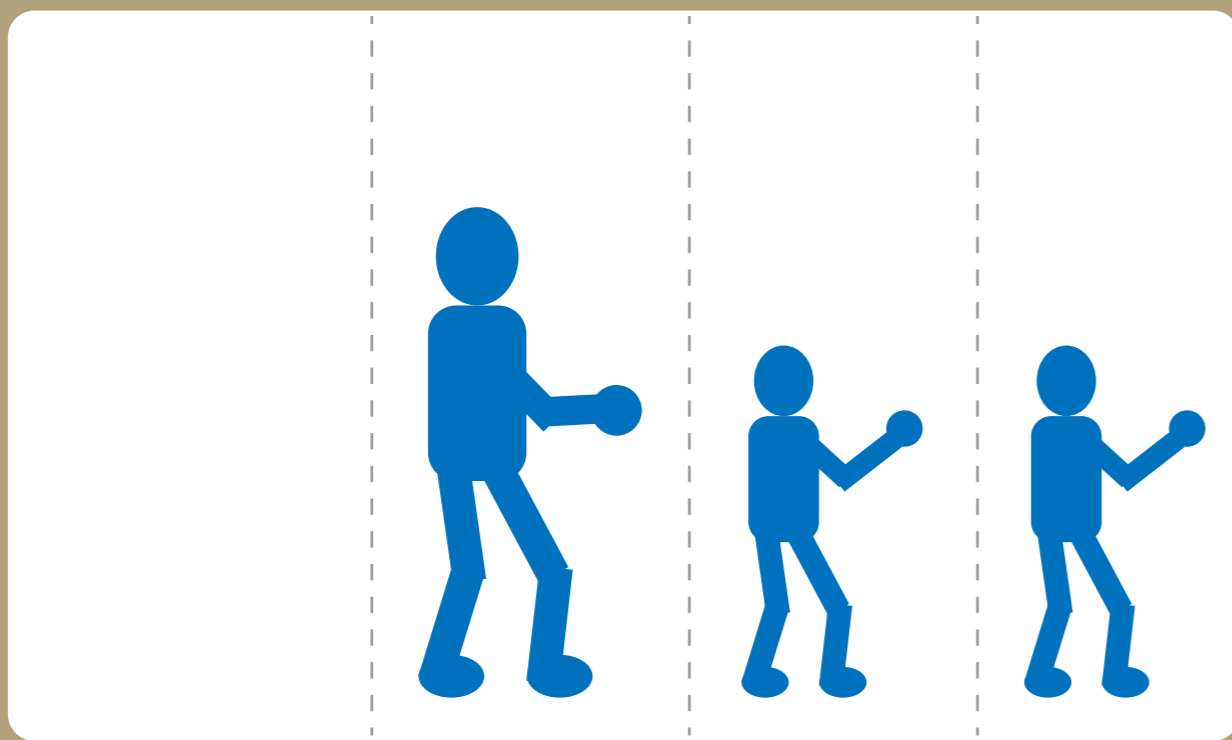
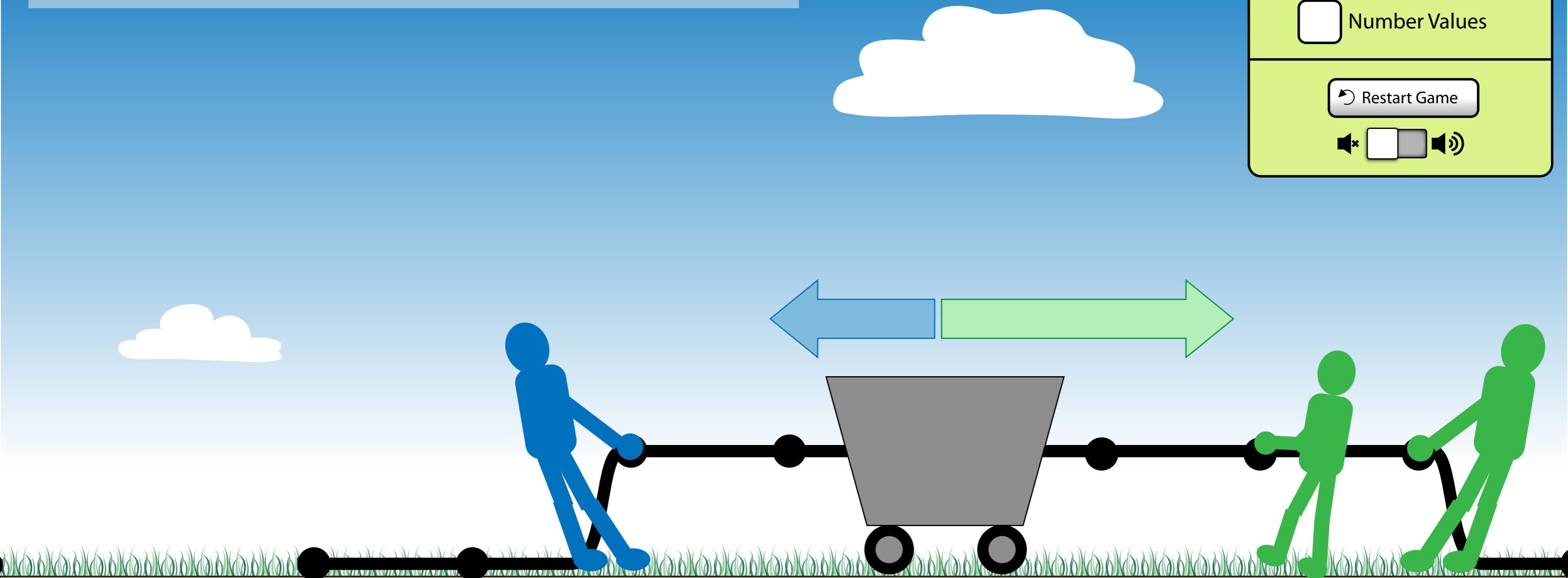
Restart Game



19 The user has pressed Tab. The Rewind button becomes highlighted.

- Show:
- Sum of Forces
 - Number Values

Restart Game

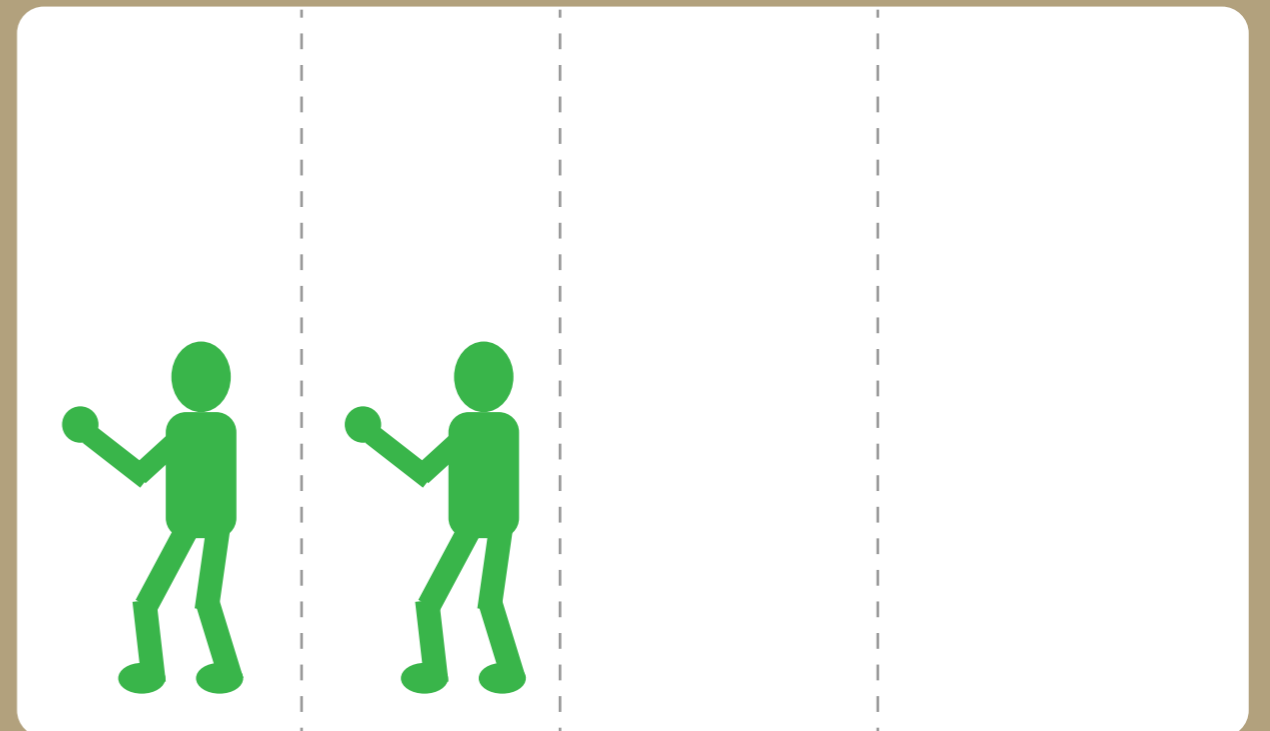
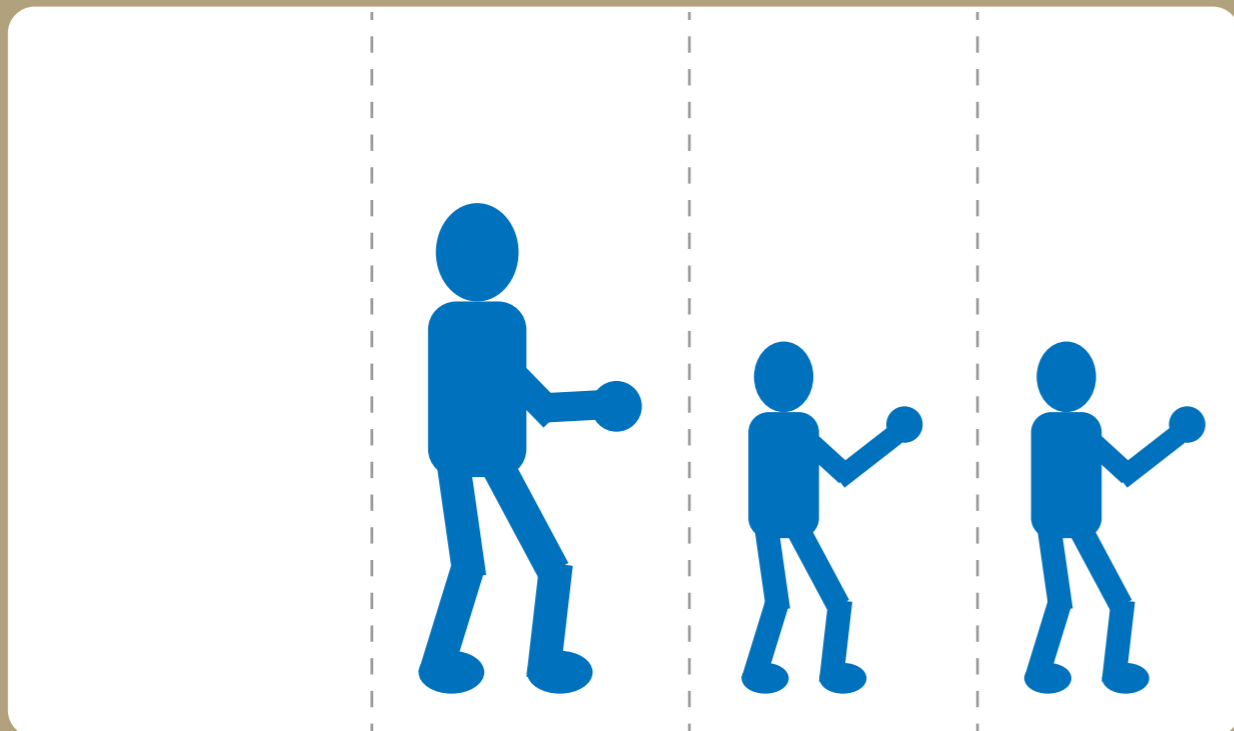
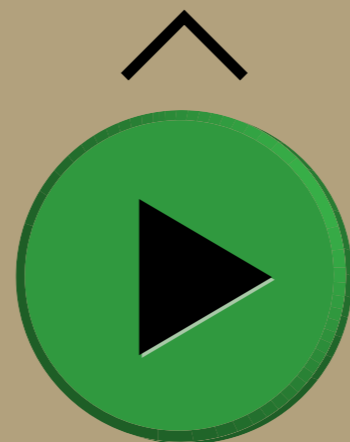
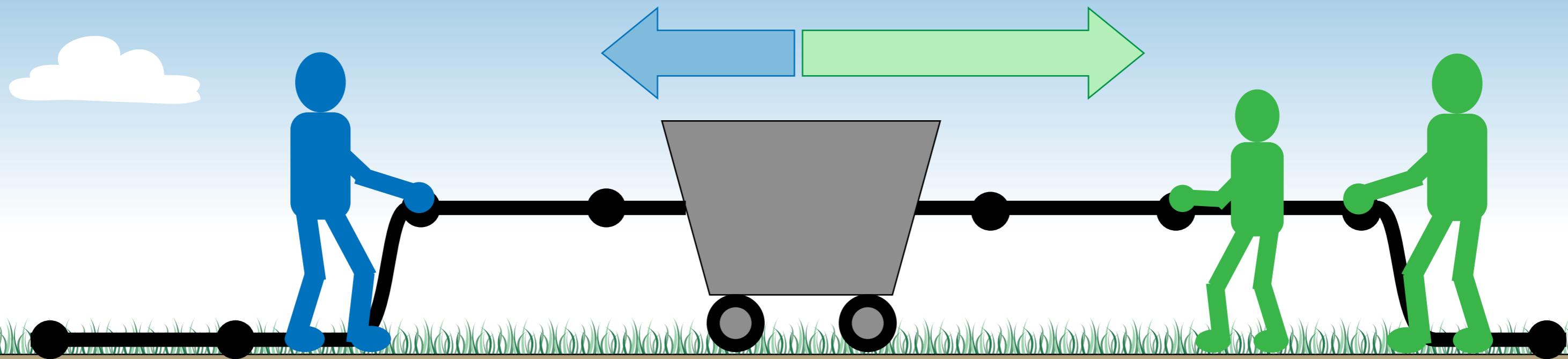


20 The user has activated the Rewind button. The simulation resets to the middle while keeping the pullers at their positions. The Rewind button becomes disabled.

Show:

- Sum of Forces
- Number Values

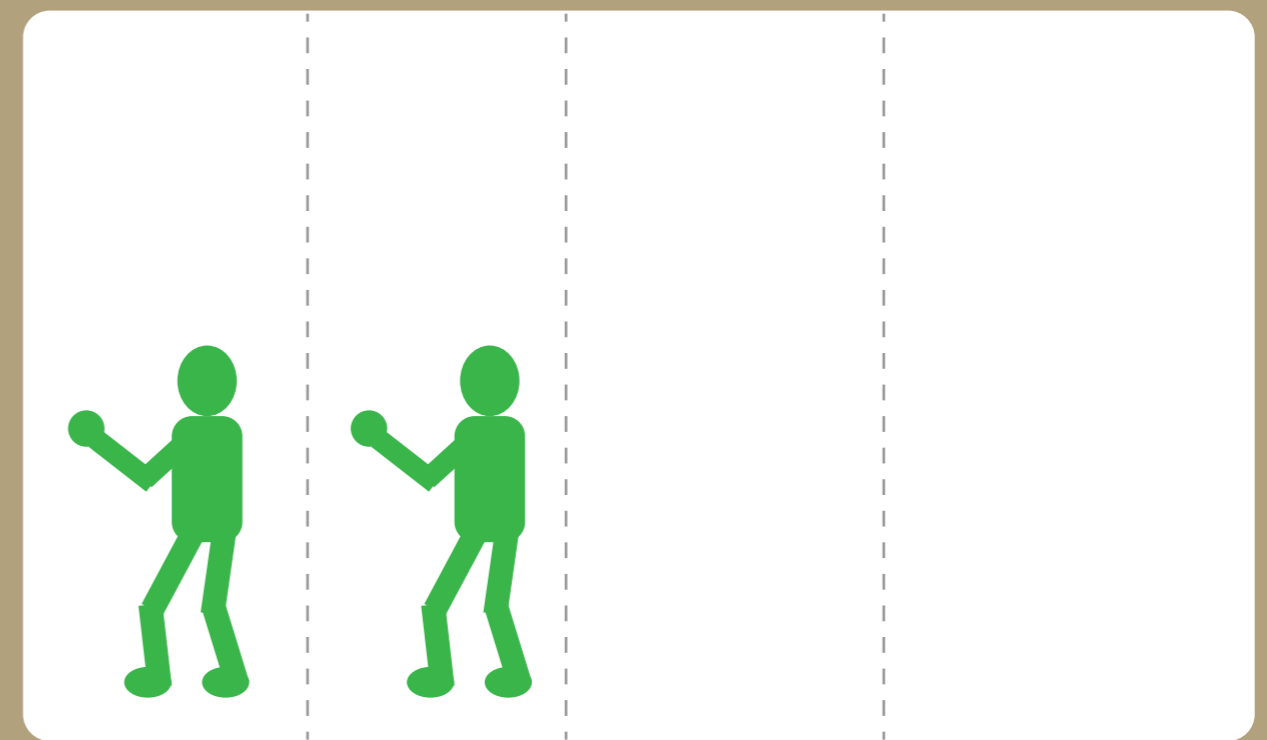
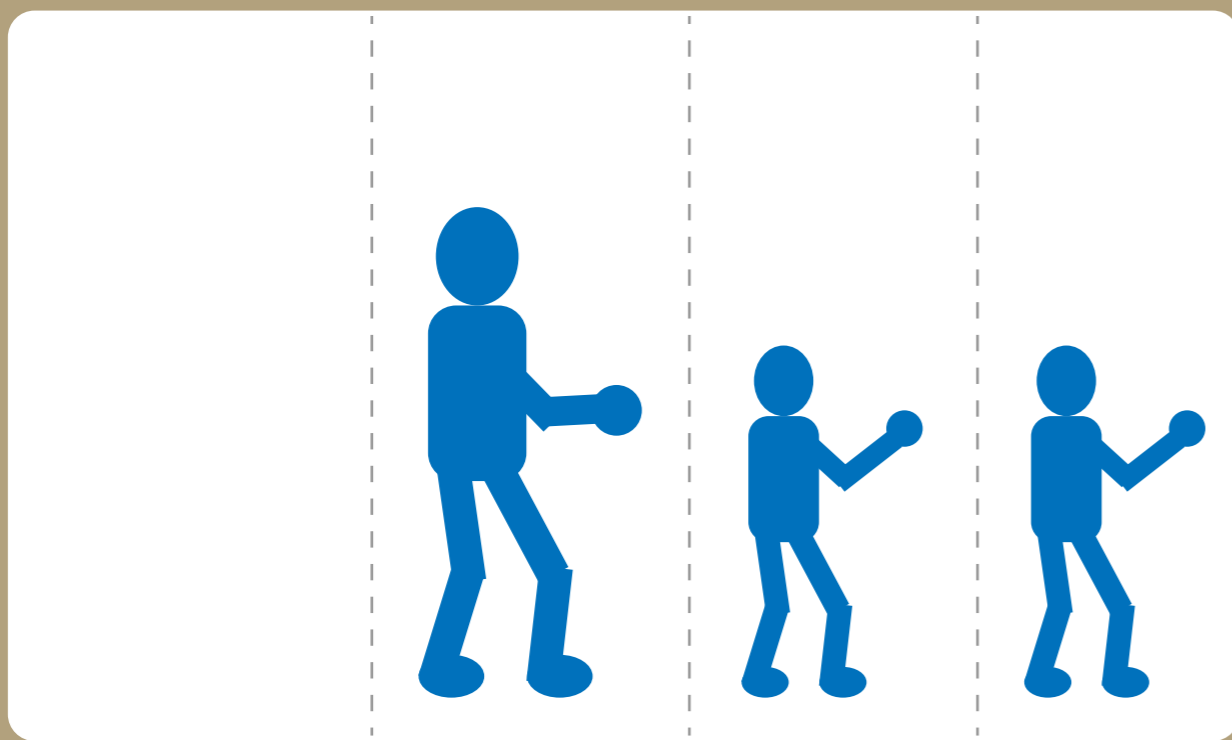
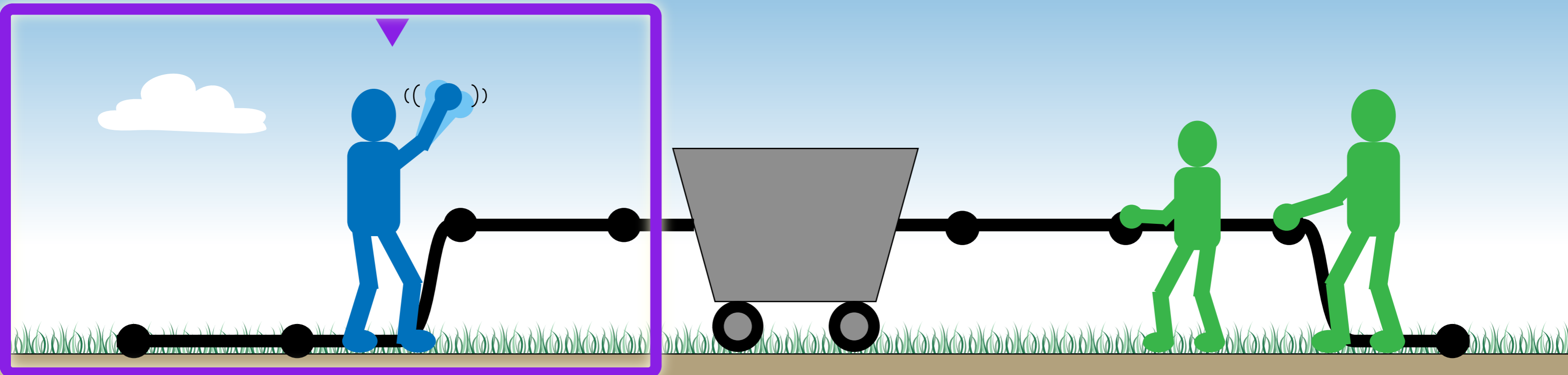
Restart Game



21 The user has pressed Tab and the highlight moves to the Left team. The one and only puller gains a cursor.

- Show:
- Sum of Forces
 - Number Values

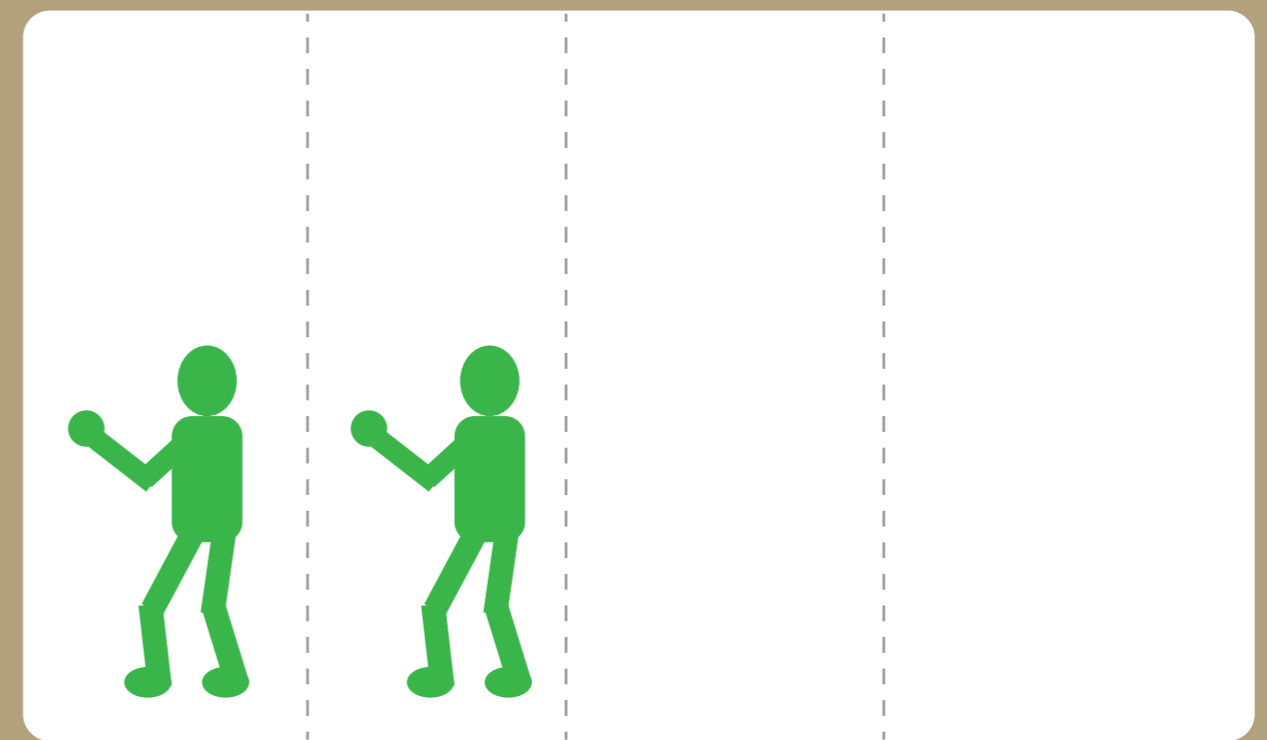
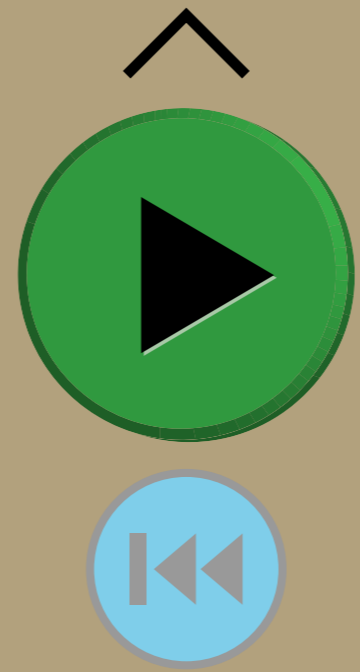
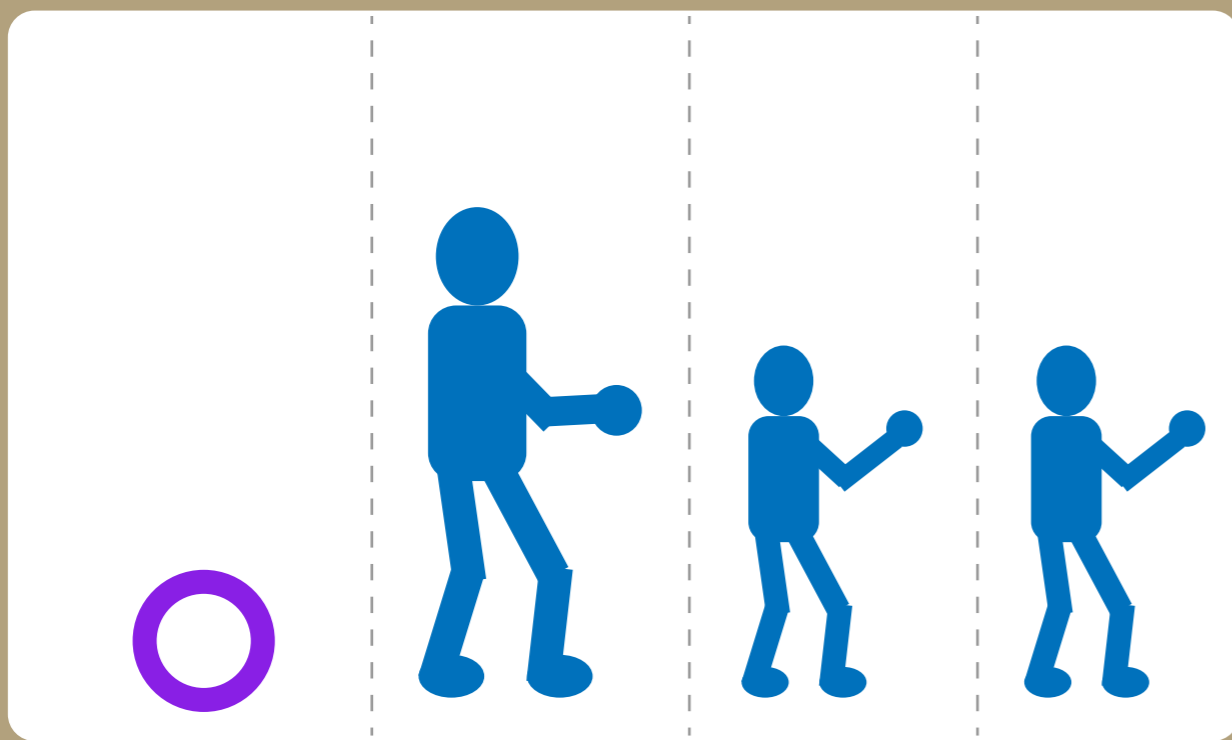
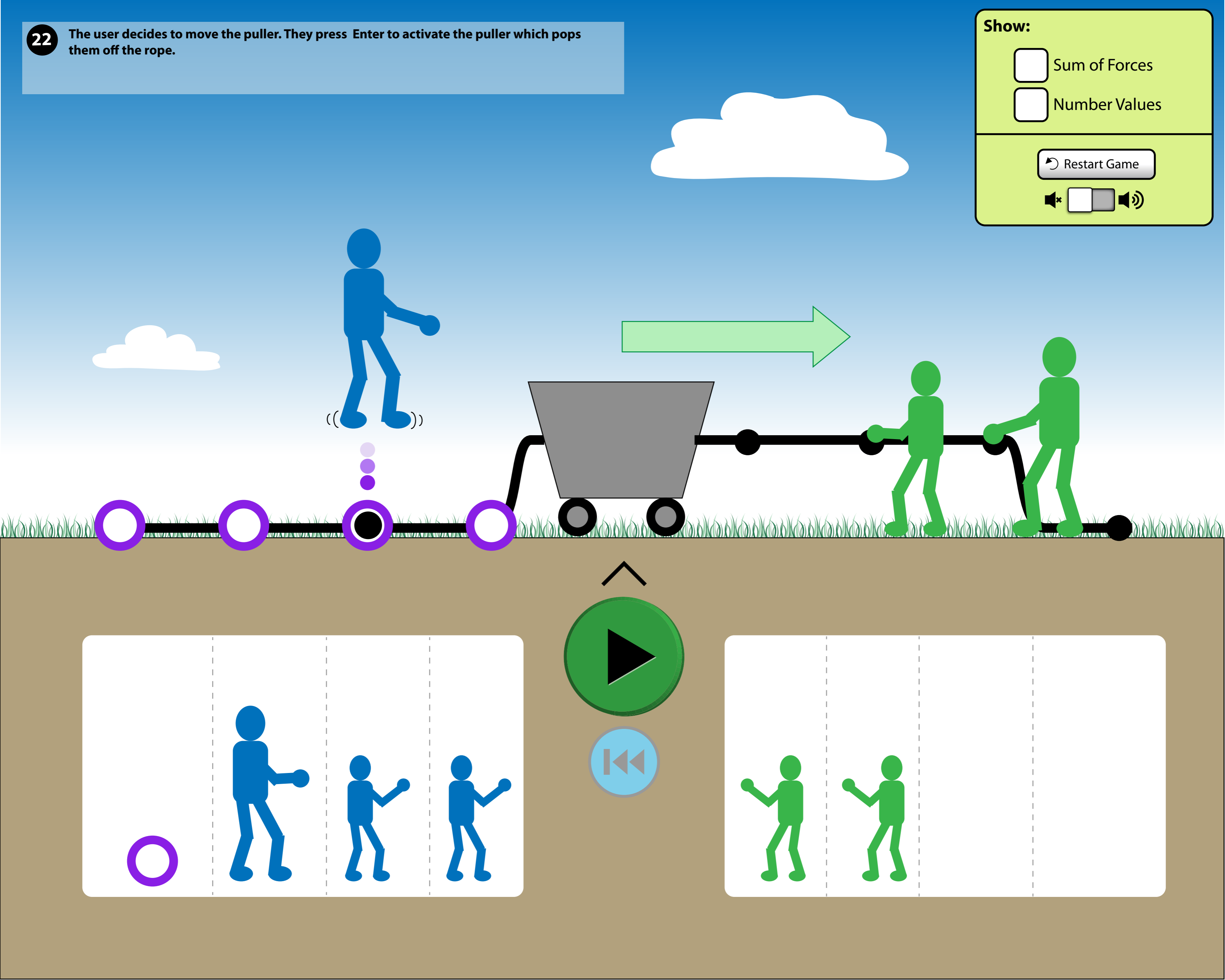
Restart Game



22 The user decides to move the puller. They press Enter to activate the puller which pops them off the rope.

- Show:
- Sum of Forces
 - Number Values

Restart Game



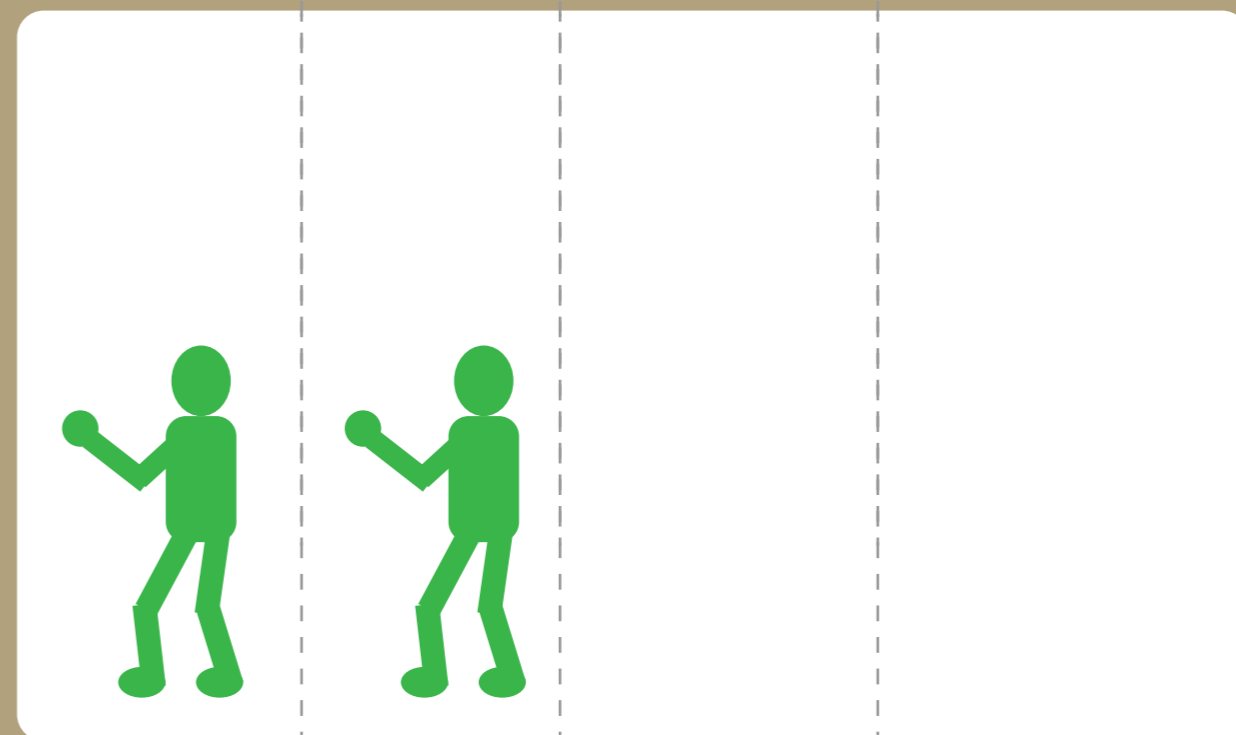
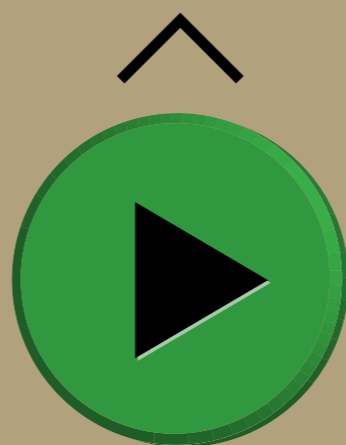
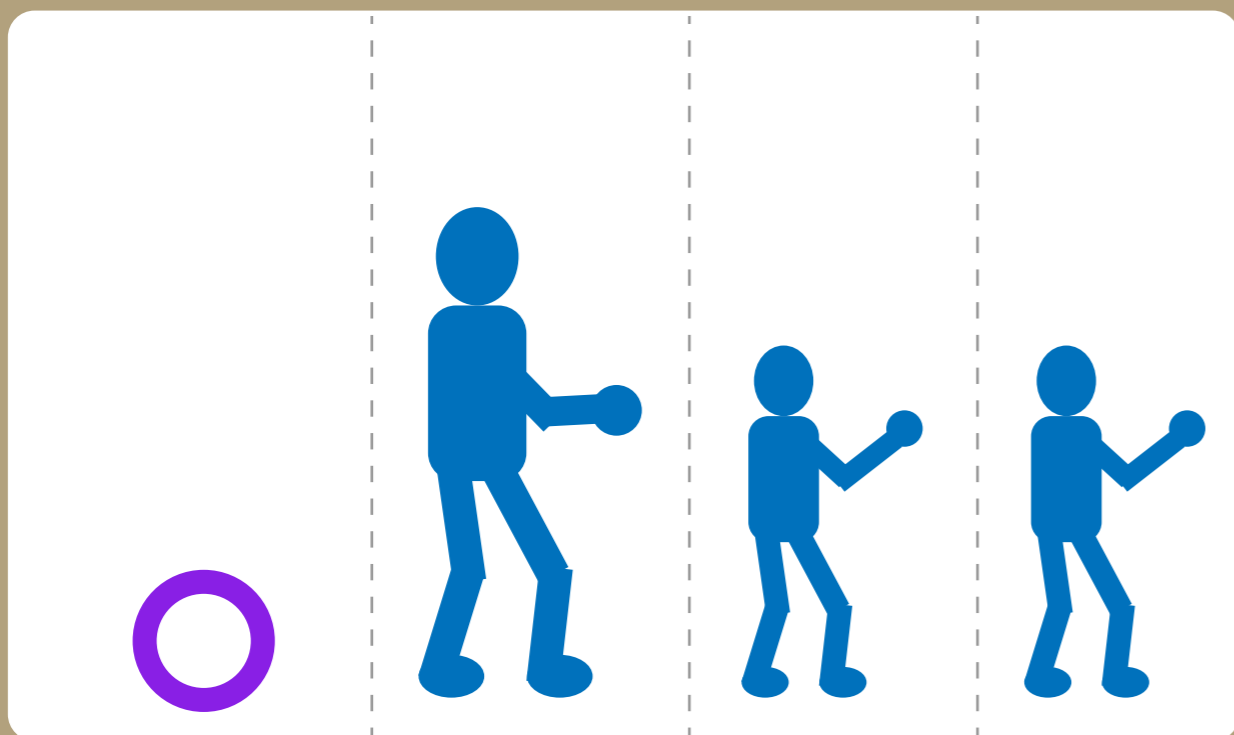
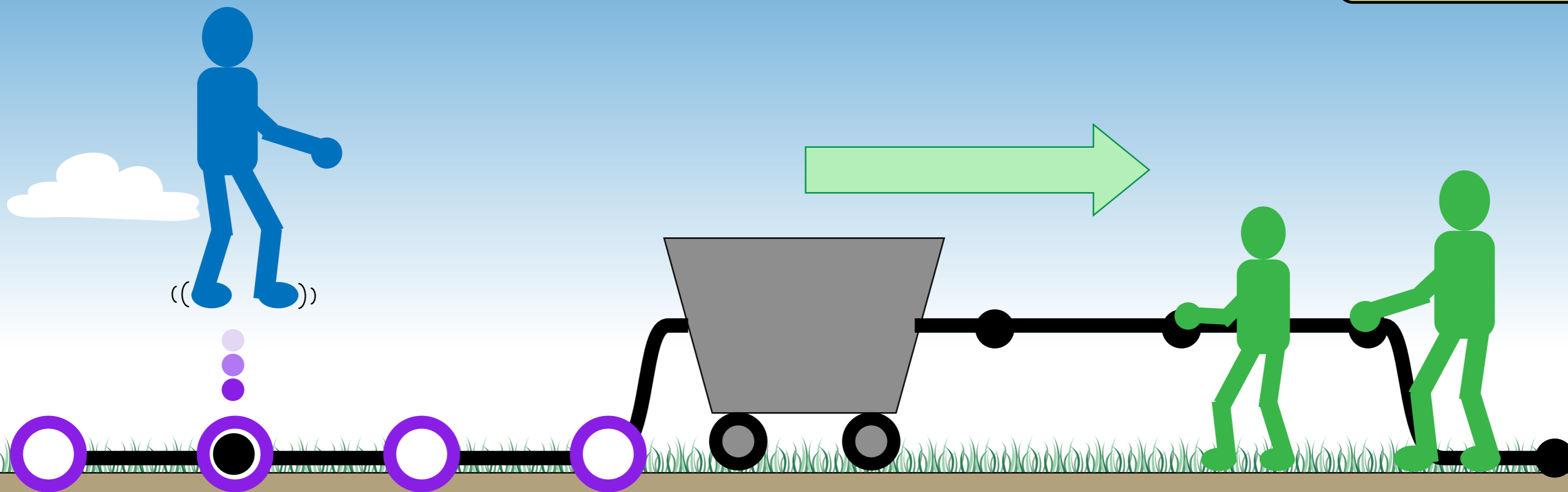
23

The user has pressed the left arrow key to change positions.

Show:

- Sum of Forces
- Number Values

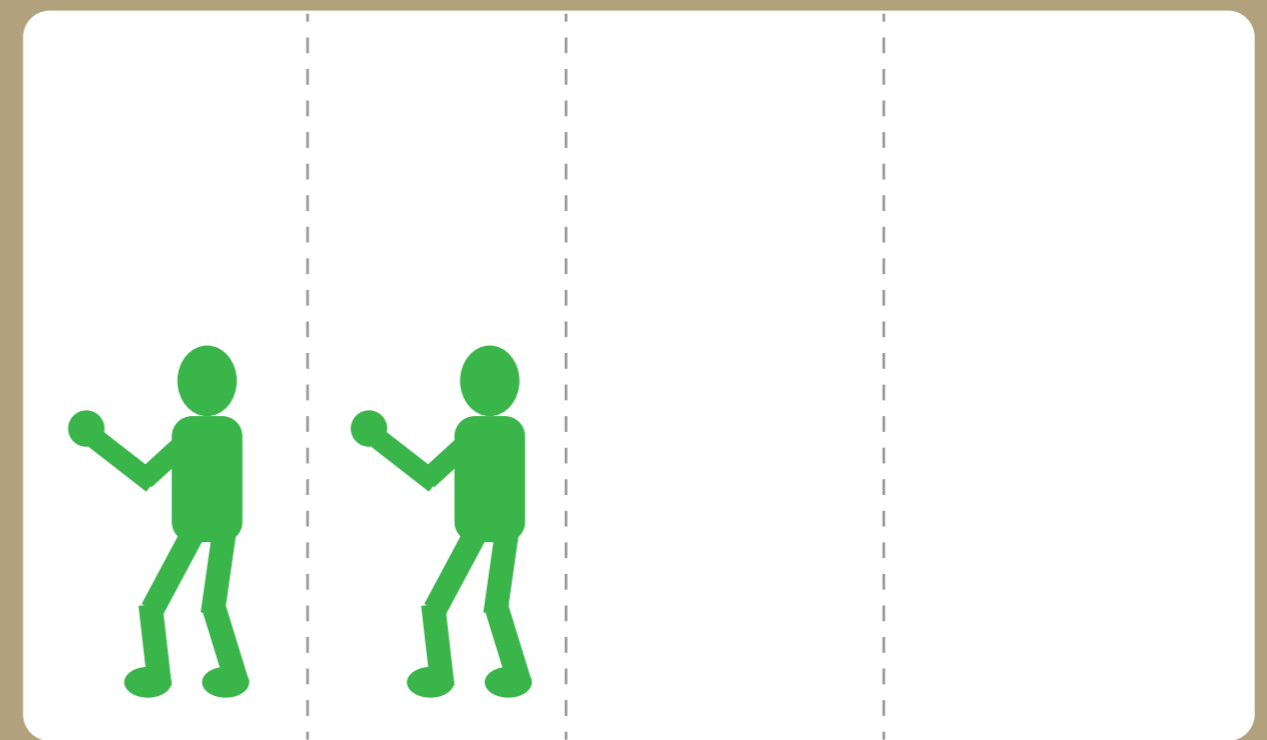
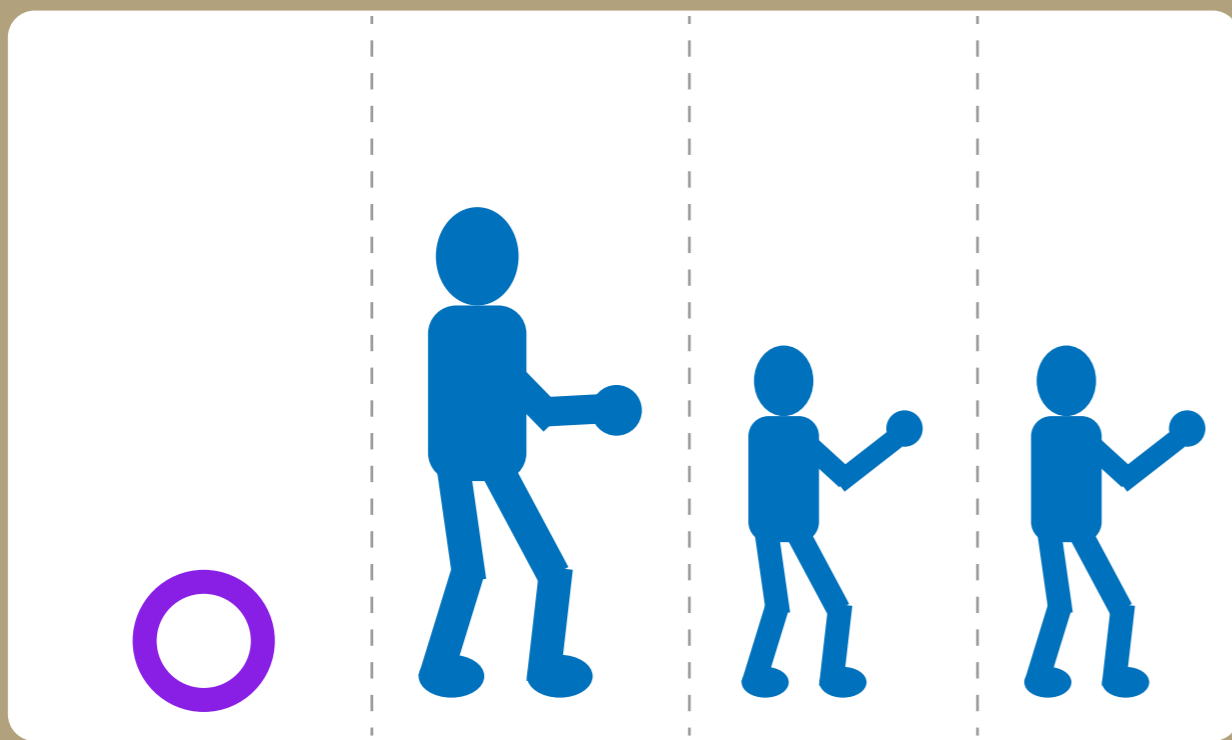
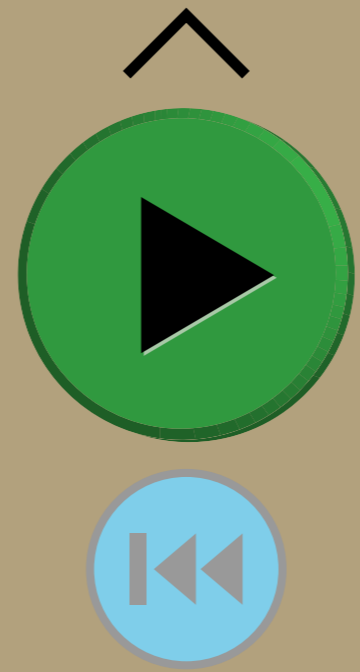
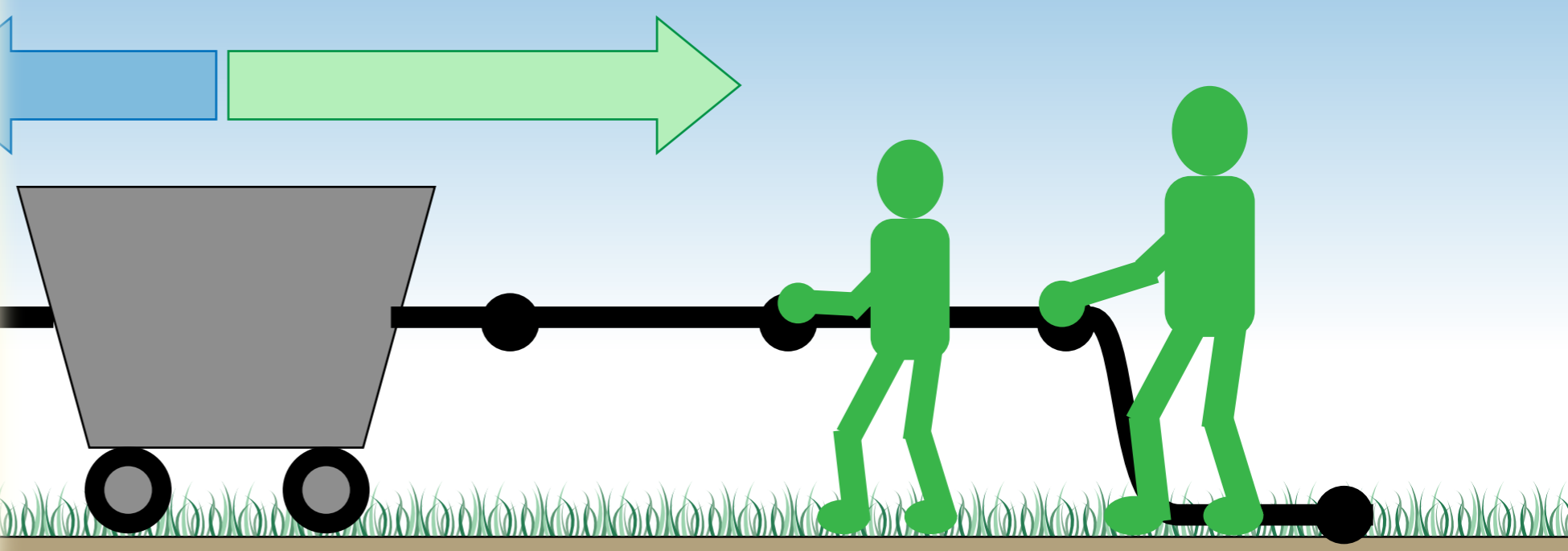
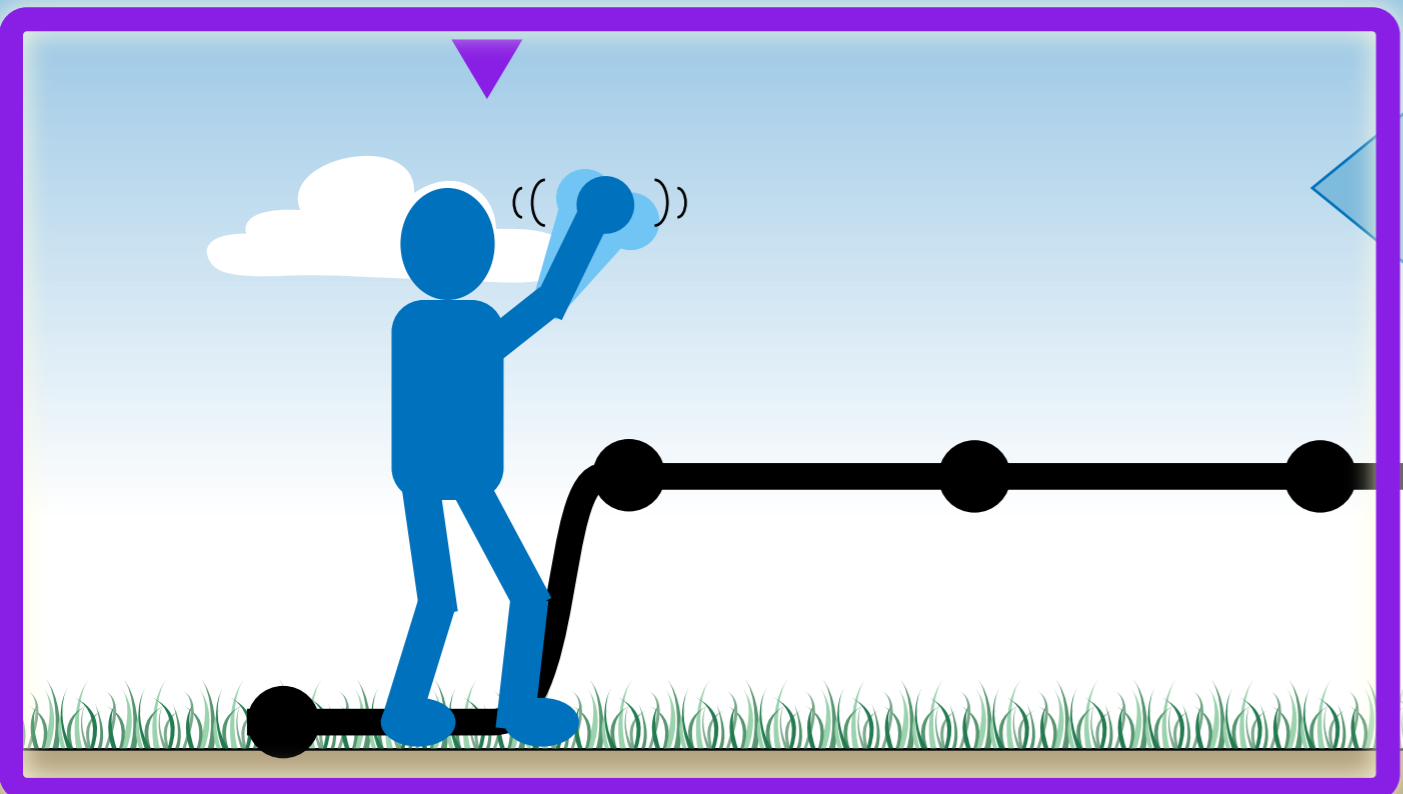
Restart Game



Show:

- Sum of Forces
- Number Values

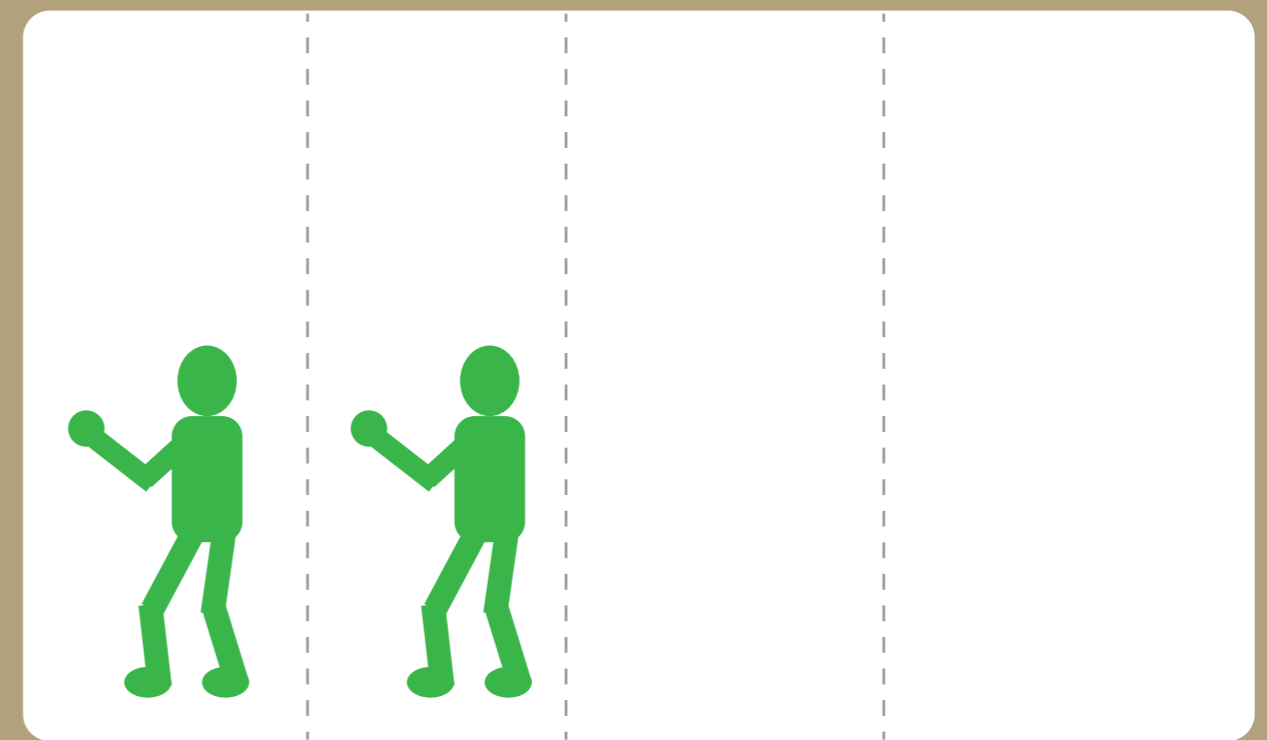
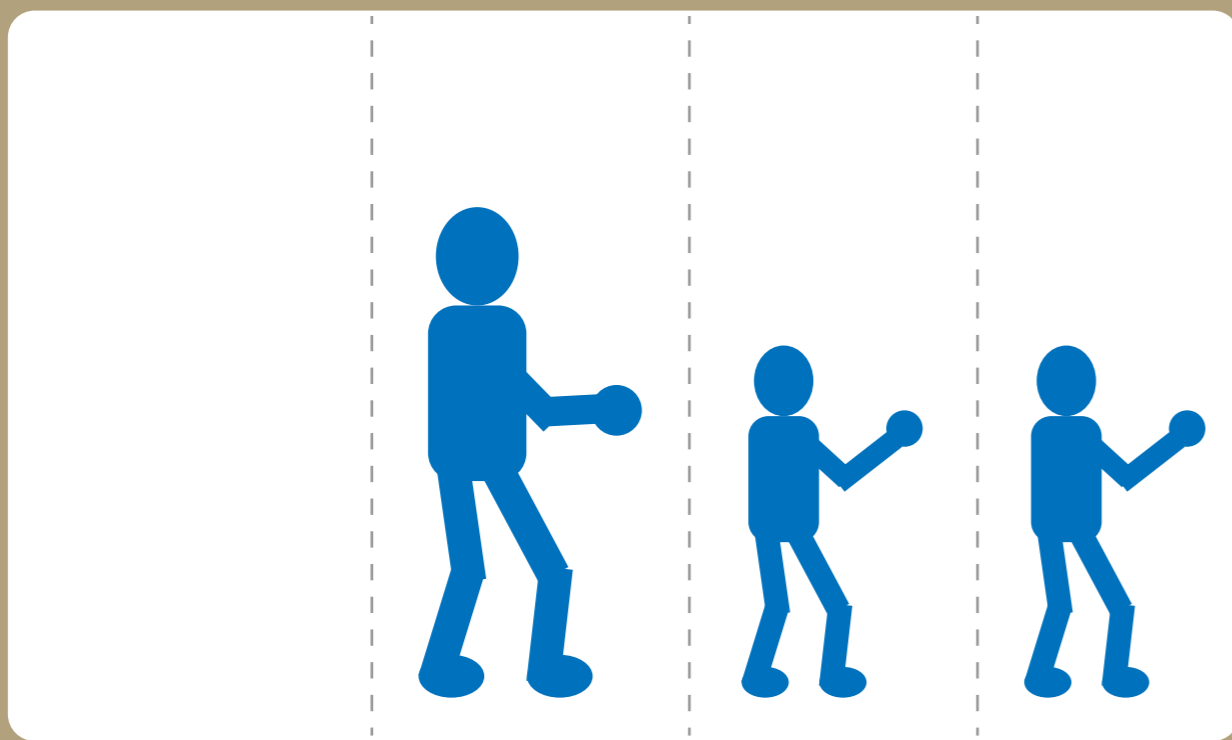
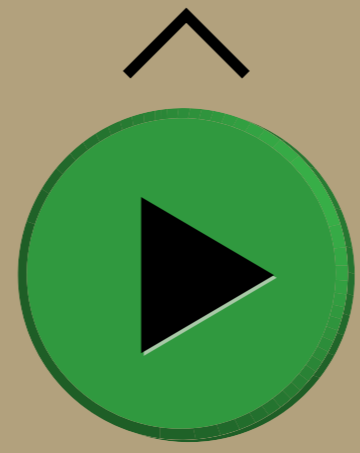
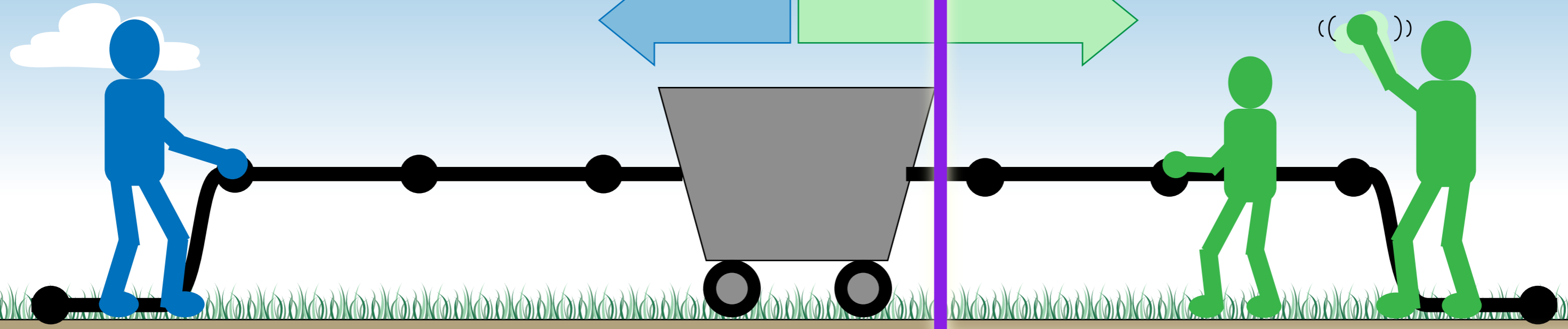
Restart Game



25 Pressing Tab moves the highlight to the next interactive group - this time the Right team.

- Show:
- Sum of Forces
 - Number Values

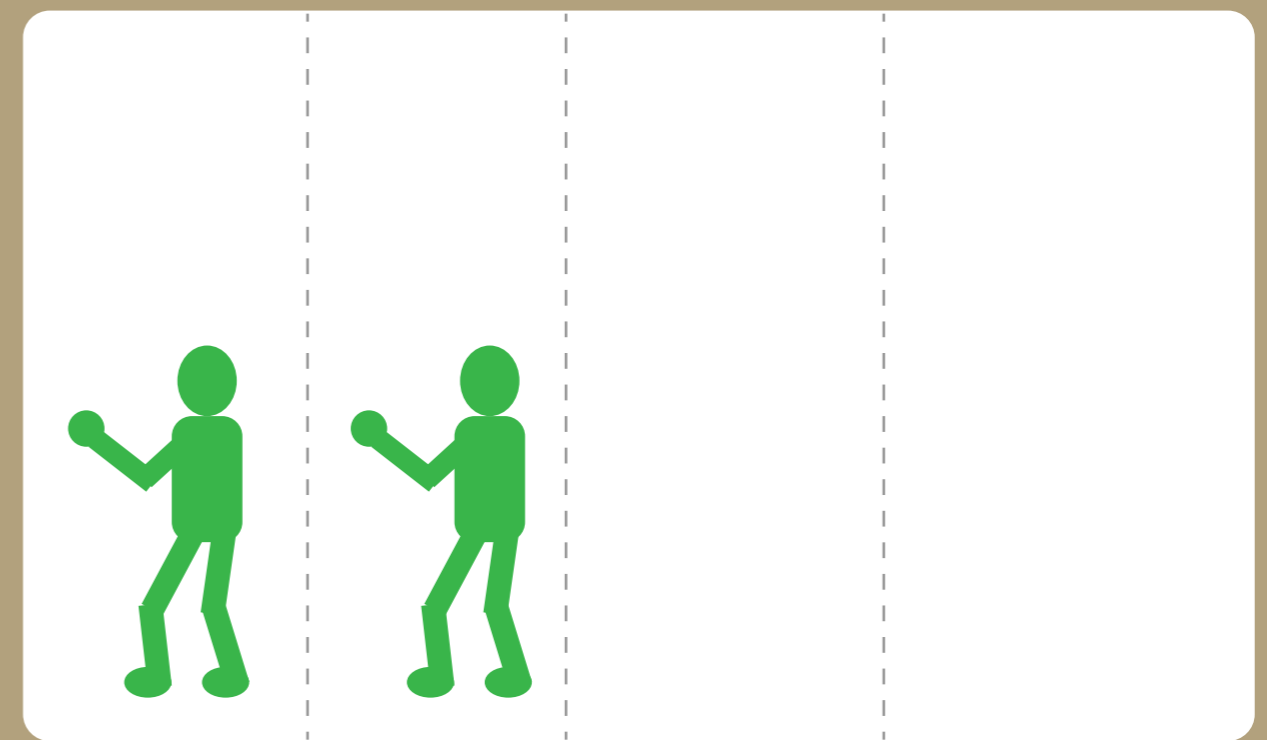
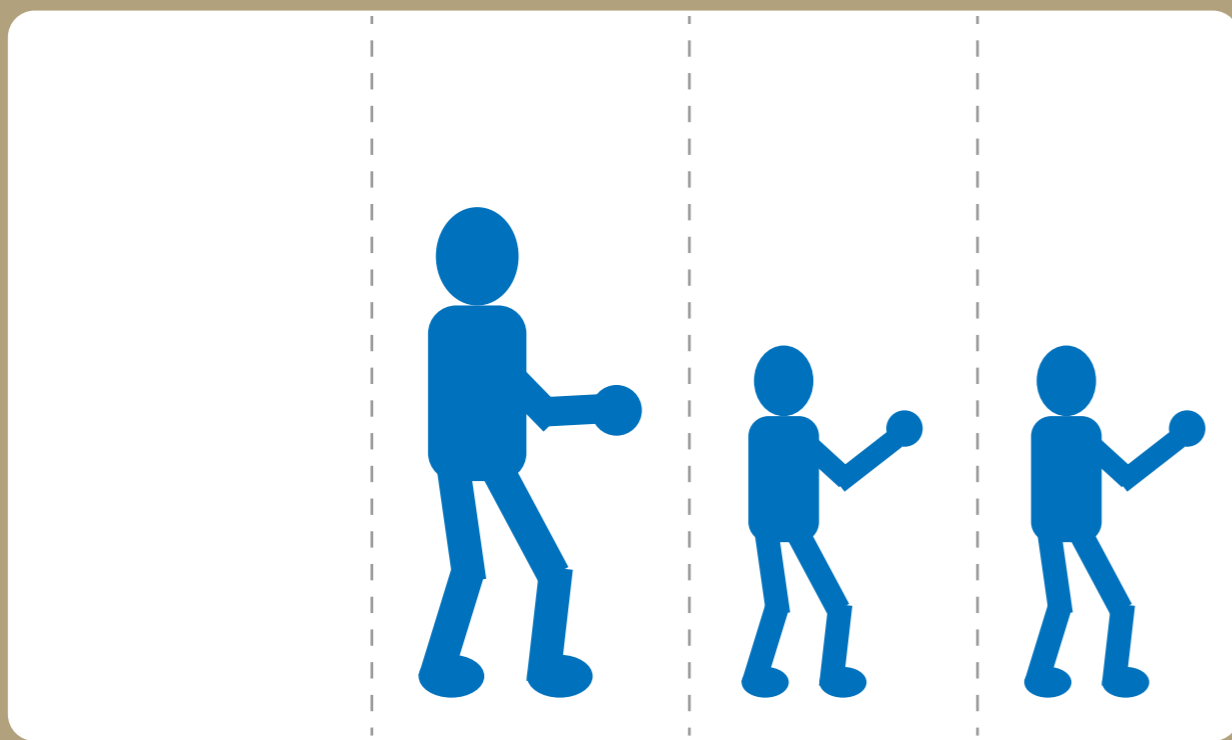
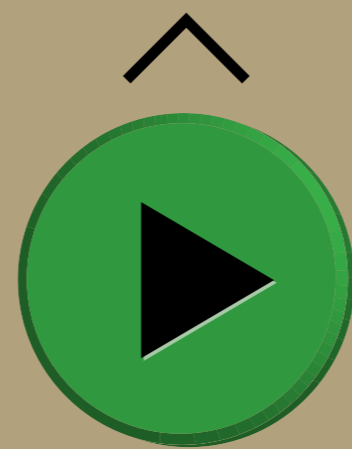
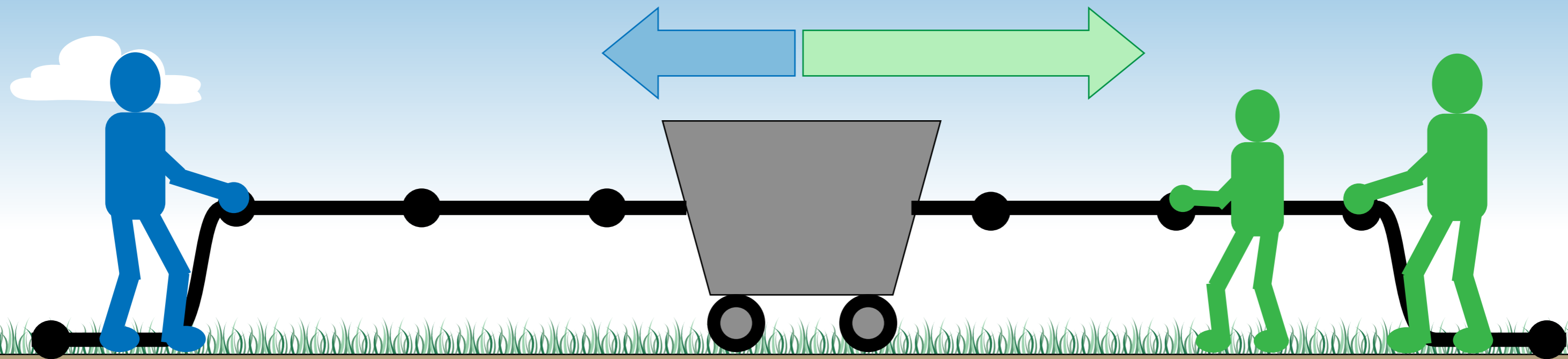
Restart Game



Show:

- Sum of Forces
- Number Values

Restart Game



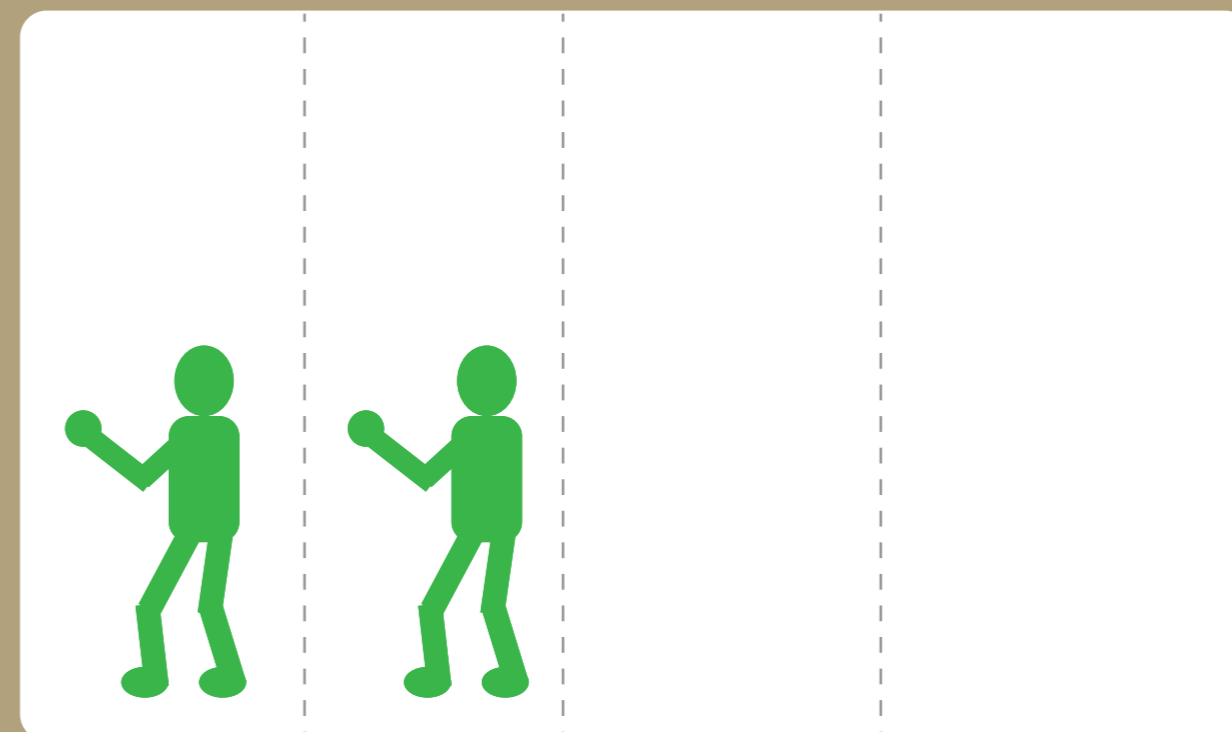
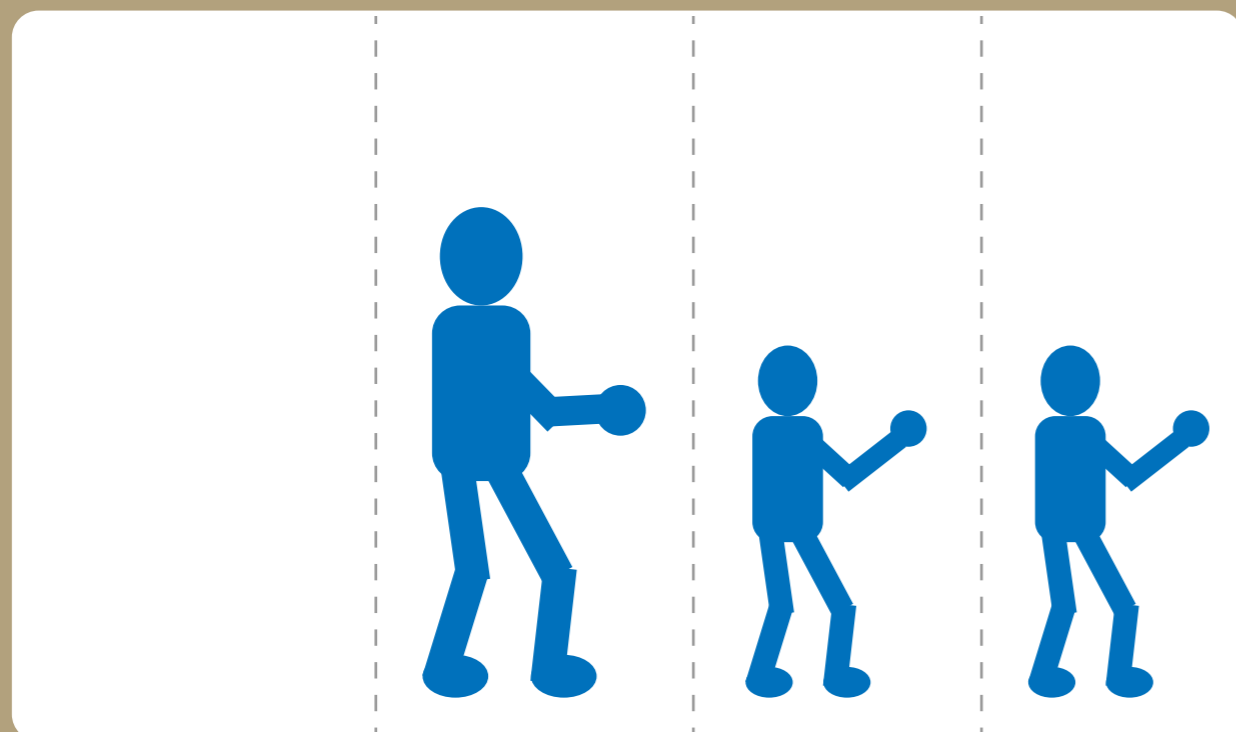
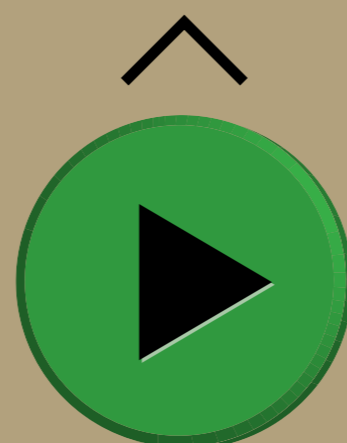
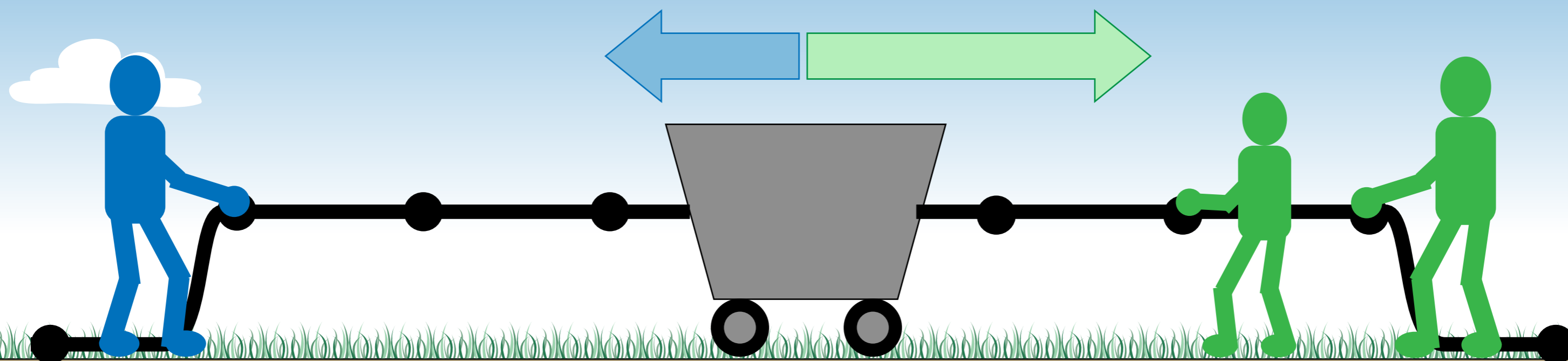
27 Pressing up/down will move the cursor along the list. Right and left arrow keys will also work.

Show:

Sum of Forces

Number Values

 Restart Game



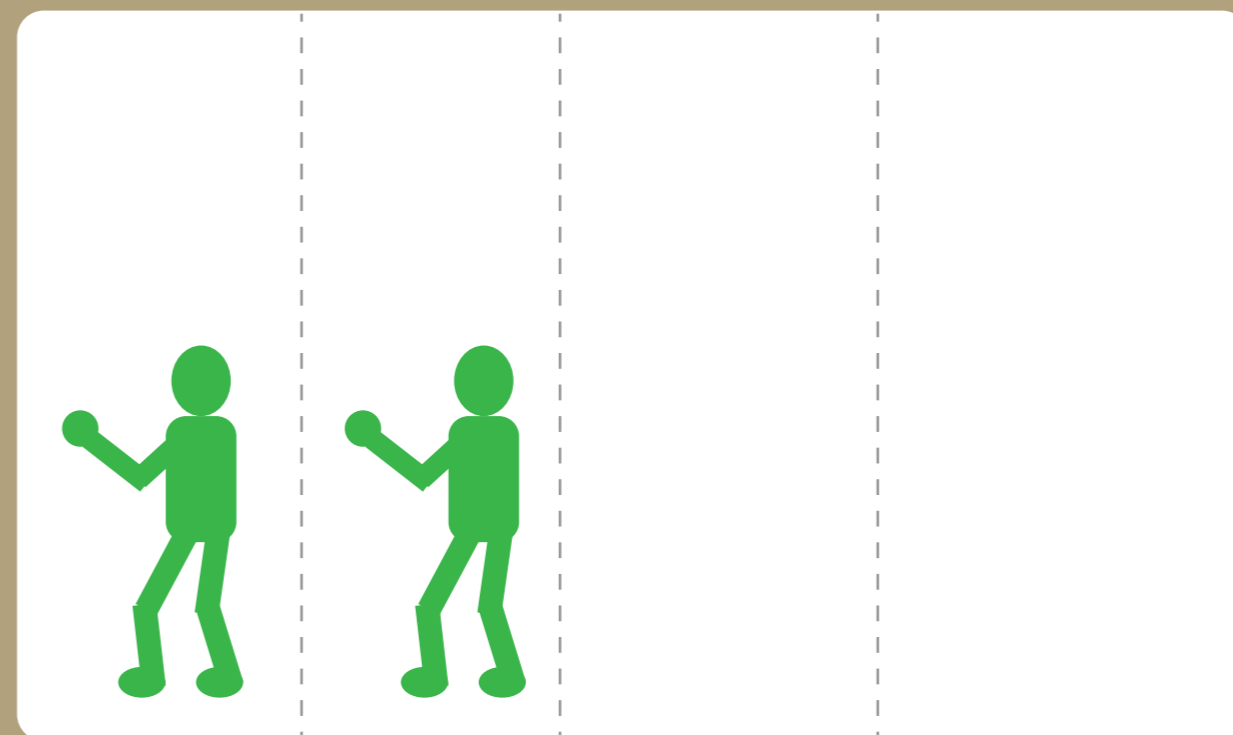
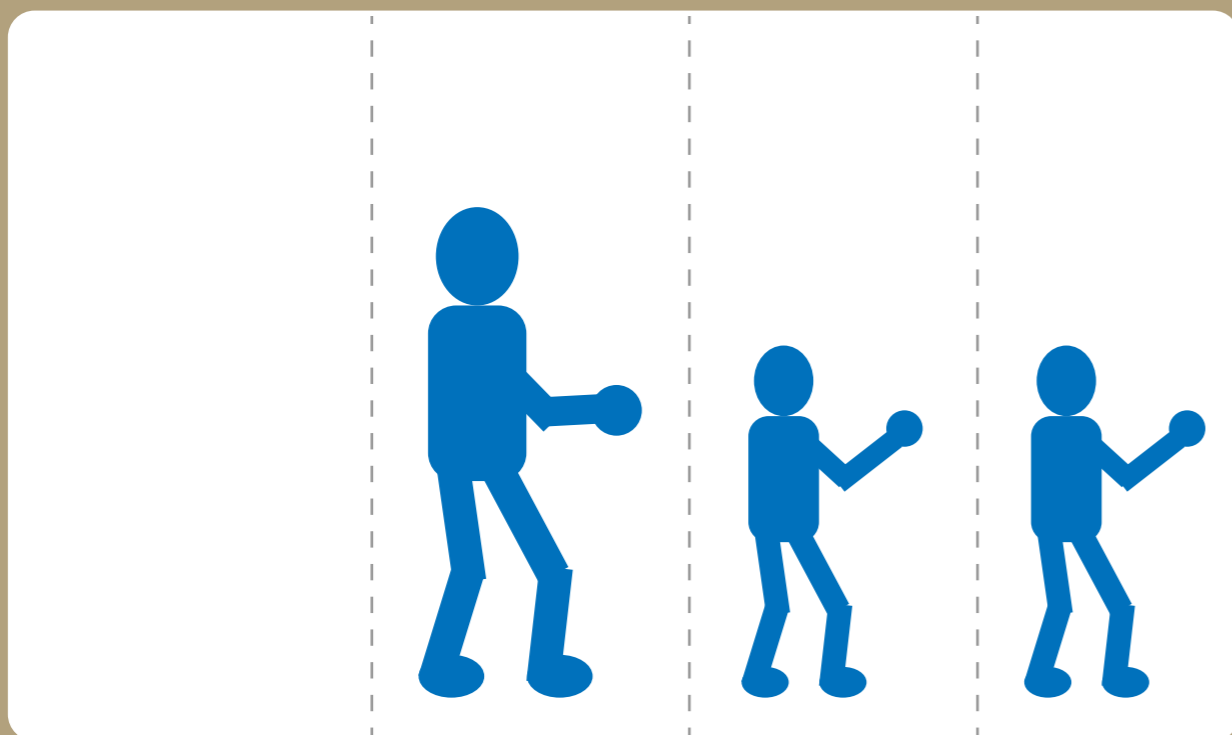
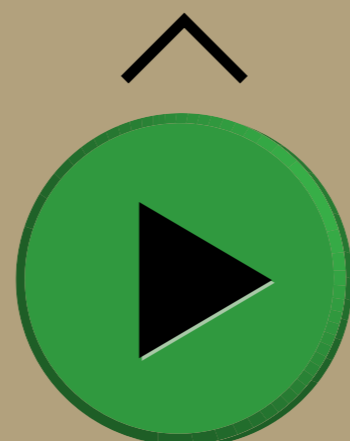
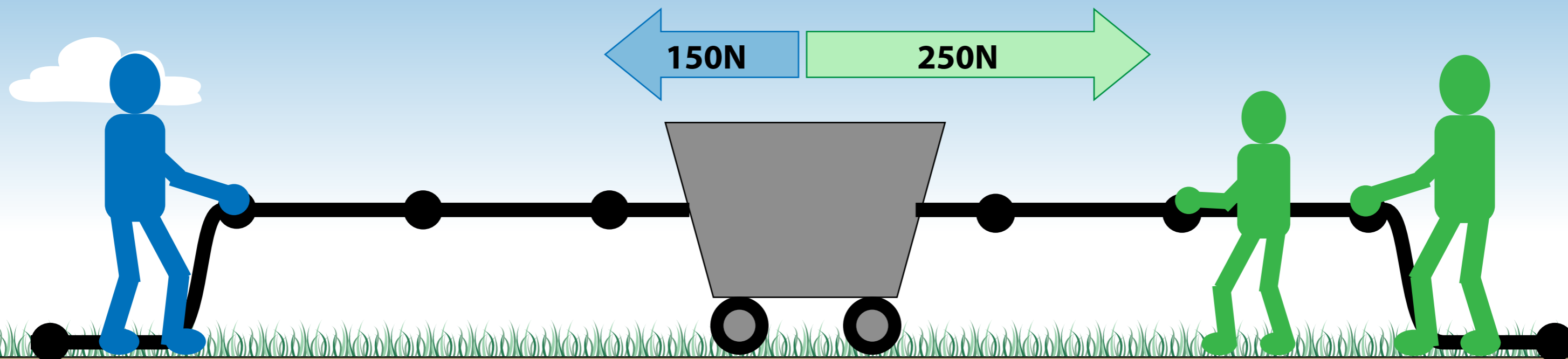
28

The user activates an option, and it appears in the game.

Show:

- Sum of Forces
- Number Values

Restart Game



Keyboard navigation within a group

Right arrow = "Next interesting interactive item in the group"

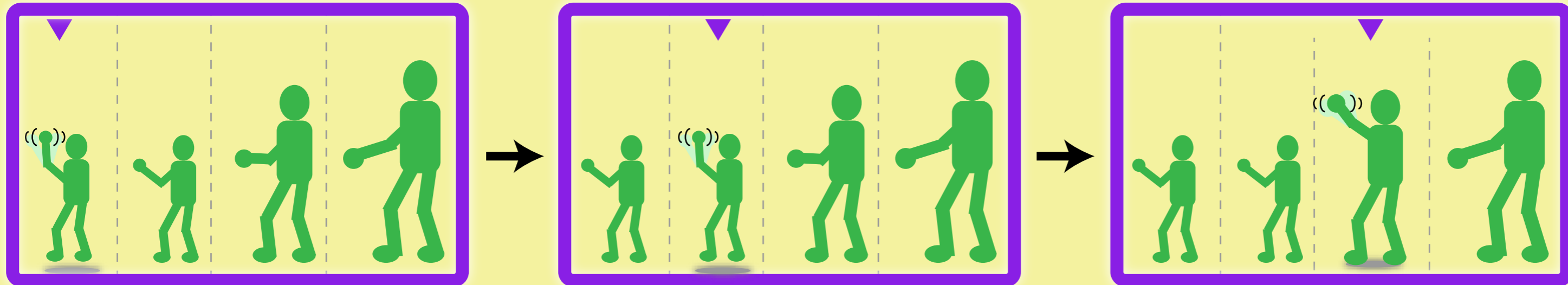
Left arrow = "Previous interesting interactive item in the group"

Enter/space = "Activate"

Note:

- Up/down arrows will work in the menu.

- Arrowing past a last item brings the cursor around to the first item.



Show:

Sum of Forces
 Number Values

Restart Game



Show:

Sum of Forces
 Number Values

Restart Game



Show:

Sum of Forces
 Number Values

Restart Game



Show:

Sum of Forces
 Number Values

Restart Game



Design notes:

Restart Game

The original circular arrow button is replaced by "Restart Game" button so it is clear what the button will do.



Original mute button can be confusing (does the button indicate the current state or does it indicate what happens if you activate it?). The audio button has been replaced with a toggle which shows the current state and what would happen if you flip the toggle.

The Puller

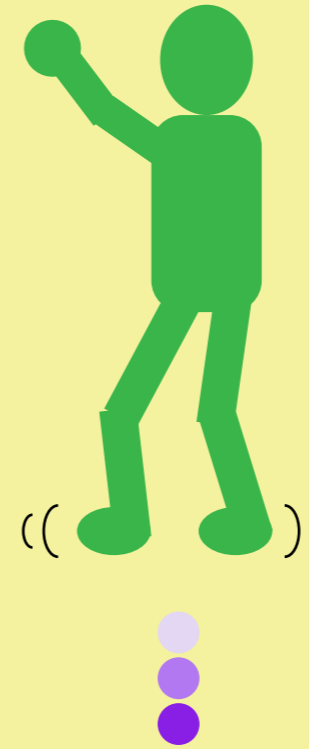


Default



Selected / Focused

Note:
- Hand wave
- Shadow on ground



"Put me down here"

For mouse, state occurs when puller is dragged over a valid drop zone.

For keyboard interaction, this state occurs when arrowing through the drop zones.

Note:
- feet animates / dangles around
- downward circles animate

The Cursor



Selected / Focused



Valid placement



**Selected / Focused
(Menu item)**

Tab Order

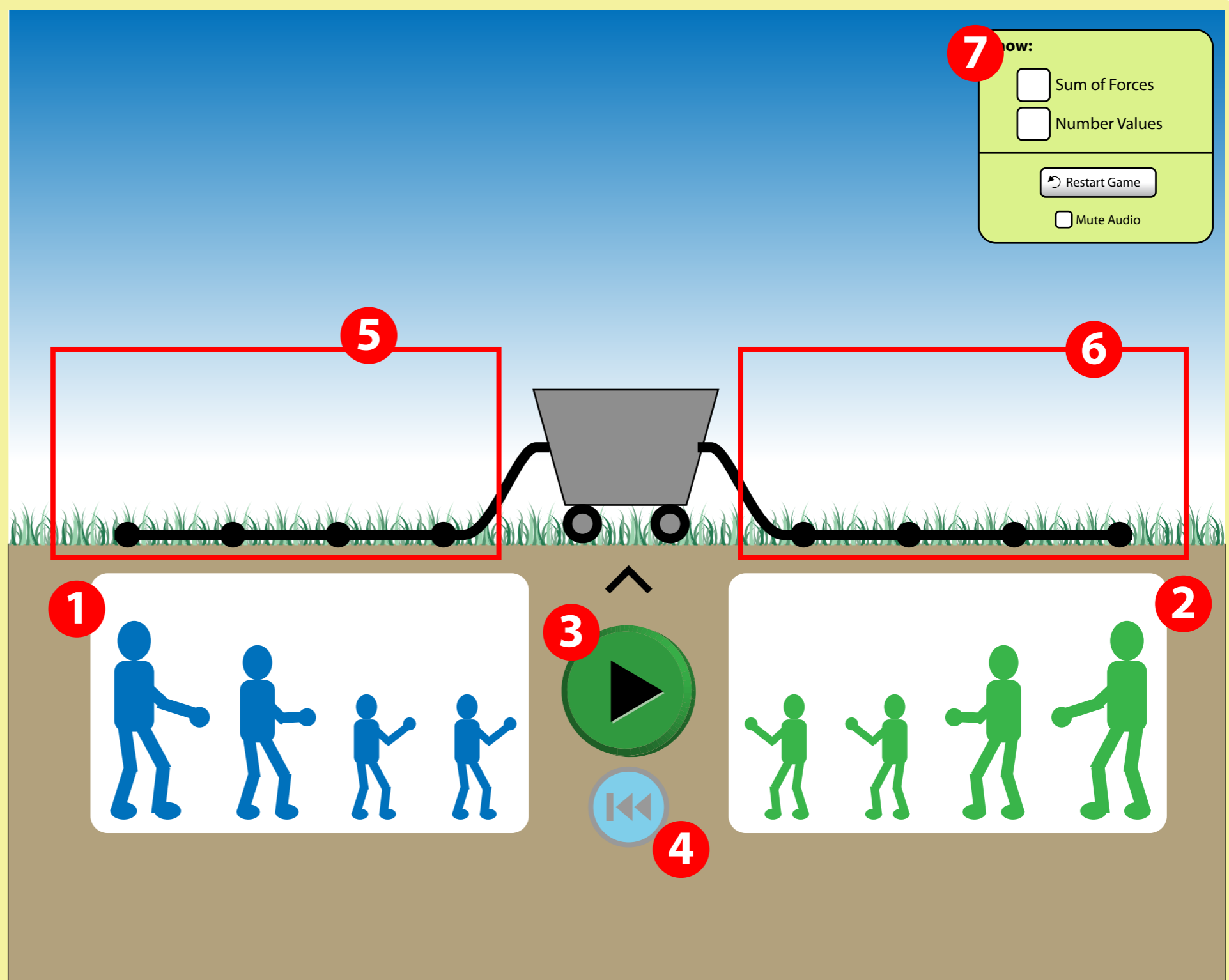
Note:

- Tabbing to a group always puts focus on the first interesting interactive item.

1. Left group
2. Right group
3. Play / Pause button (always keyboard focusable)*
4. Rewind button (always keyboard focusable)*
5. Left rope
6. Right rope
7. Game menu

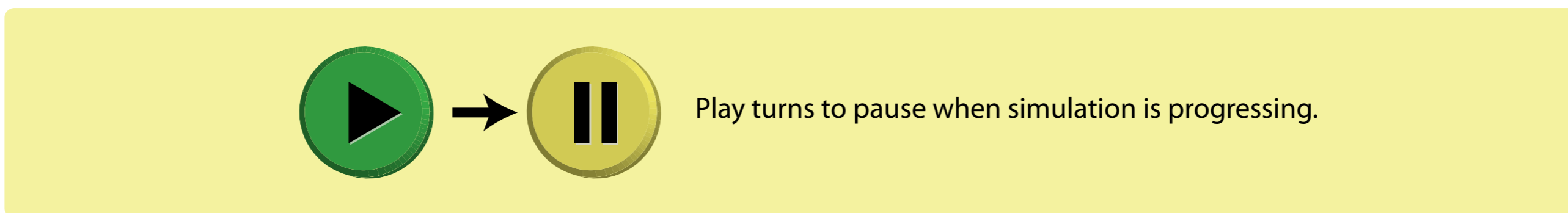
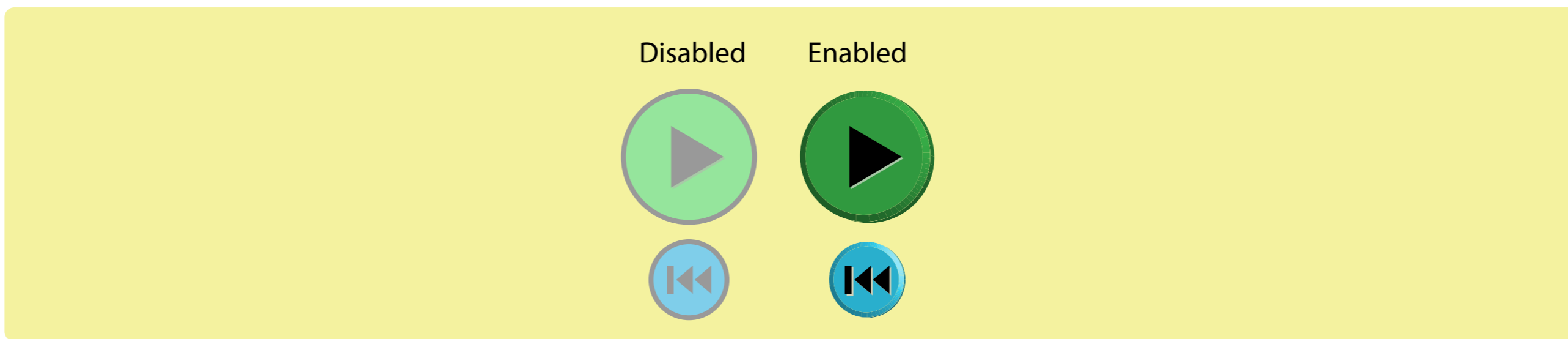
*

- Initially the button is invisible.
- If invisible and gets focus, the button fades in.
- Once a puller is placed on the rope, the button will always be visible and will never disappear even if all pullers are removed.



Go and Rewind Buttons

Go and Rewind buttons may be disabled, but always exist in the tab order. Its state (whether enabled or disabled) should be reported to users of assistive technologies.



Alternate Game Control Layout

“Restart game” button has been renamed to “New Game” and moved to the bottom of the central game area.

“Play” button replaced with “Go!” button, and “Rewind” button replaced with “Reset Cart”.

These changes were done to make it clearer to the user what the outcome would be if they activated that particular button.

Show:

Sum of Forces

Number Values

