Key Points for the Facilitator	• Encourage students to challenge themselves when creating update-player by completing one of the extension ac • The update-player function is one of the main places where students can set their game apart and make it theirs. exploration and experimentation! • Adding comments to code - if you have to ask a student "What are you trying to do there?", then they probably n comments!

Language Table

Types	Functions	Values
Number	`*`, `sqrt`, `*`, `+`, `-`, `/`, `+`	`4`,`-1.2`,`2/3`,`pi`
String	`string-length`, `string-contains?`, `string-repeat`	`"hello"`,`"91"`
Boolean	`<`, `<=`, `<>`, `>`, `>=`, `and`, `or`, `<`, `<=`, `<>`, `>=`, `string<>?`, `string, string=?, string>=?, string>?`	`true`,`false`
Image	`circle`, `ellipse`, `radial-star`, `regular-polygon`, `rhombus`, `star`, `triangle`, `square`, `star`, `triangle`, `circle`, `star`, `triangle`	🔵, 🔺, 🔶

Click here to see the prior unit-based version

Glossary

contract :: a statement of the name, domain, and range of a function

debug :: to find and fix errors in one's code

function :: a mathematical object that consumes inputs and produces an output

piecewise function :: a function that computes different expressions based on its input

Students open their **Game Project file** and look for `update-player`, then figure out what the contract represents.

Strategies for English Language Learners

MLR 6 - Three Reads: Have students read through the problem statement three times, looking for different information. What is the problem asking me? What is the ***contract*** for this ***function***? What information do I need to create that function?

- **What is the contract for `update-player`?**

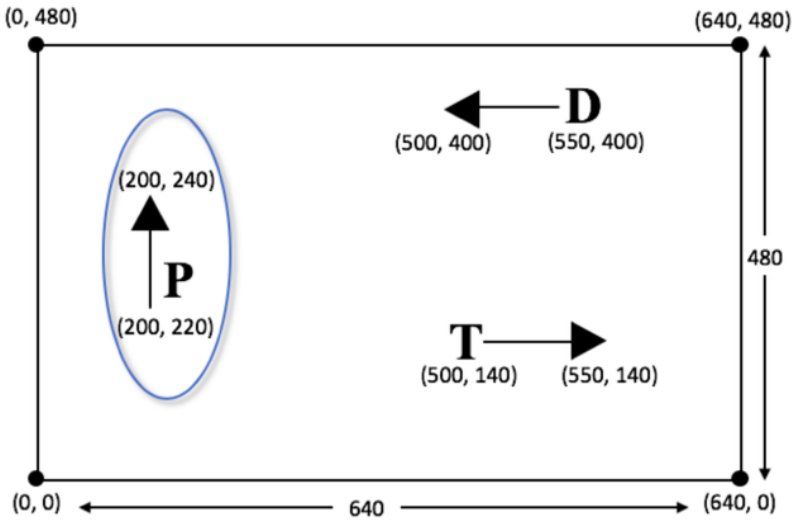
  The Name is `update-player`, the Domain consists of a Number and String, and Range is a Number.

- **What does each part of the domain and range represent?**

  Domain: the Number is the y-coordinate of `PLAYER`, the String is the key that the user pressed; Range: the Number is the new y-coordinate of `PLAYER`

- **How does the y-coordinate of `PLAYER` change when the user presses the "up" key?**

  It should increase, the program should add something to it



Students complete Word Problem: update-player with a partner, then type their code into their **Game Project file** and test.

Common Misconceptions

- Students often think of this function as returning a *relative distance* (e.g. "it adds 20"), instead of an absolute coordinate (e.g. "the new y-coordinate 20")

Synthesize

- How is this function similar to the piecewise functions you've seen before? How is it different?
- How could we change this function so that the "W" key makes the player go up, instead of the arrow key?
- How could we change this function so that the "W" key makes the player go up, *in addition to* the arrow key?
- Suppose your little brother or sister walks by and hits a random key. What should happen if you hit a random key that doesn't have a meaning in you What happens now?

- Wrapping - add code to `update-player` such that when `PLAYER` moves to the top of the screen, it reappears at the bottom, and vice versa
- Hiding - add a key that will make `PLAYER` seem to disappear, and reappear when the same key is pressed again

Reminder: Use `#` to add comments to code!

Adding useful comments to code is an important part of programming. It lets us leave messages for other programmers, leave notes for ourselves, or "t
of code that we don't want or need to ***debug*** later.

Have students complete at least one of the Challenges for update-player before turning to their computers.

Synthesize

Have students share back what they implemented. Sharing solutions is encouraged!

Question: What would it take to make the player move left and right? Why can't we do this without changing the contract?

Pedagogy Note

It's likely that once they hear other students' ideas, they will want more time to try them out. If time allows, give students additional *slices* of "hacking time", bringing them back to share each other's ideas and solutions before sending them off to program some more. This dramatically ramps up the creativity and engagement in the classroom, giving better results than having one long stretch of programming time.