

## **P2 Level Design -Mechanics and Layout**

Like P1, this stage will also have three obstacles, unlike P1, not only is this stage bigger (each level will take a whole screen, but by shrinking elements, you can compensate for a fixed screen) but each obstacle features higher complexity. Some interactions will not help the character proceed.

The P2 level takes its themes from Topic 3: Motions and forces:

- Catapult puzzle ( $F=ma$ )
- The blocking box (the effect of friction)
- The twin ramps (resultant forces and acceleration)

### **Name: P2**

**Class:** Stage

**States:** Incomplete, Complete

**Can transfer states:** no

**Starting state:** Incomplete

**Algorithm(s):**

If [P.Teleporter]: {on},  
And [P1]: not {Incomplete},  
enter {Incomplete}.  
While: {Incomplete},  
[P2] will be assigned to main instance.  
If [Battery]: {Win},  
enter {complete}.  
While: {complete},  
[P2] will be deleted.

### **Name: P2.Teleporter**

**Class:** Stage object

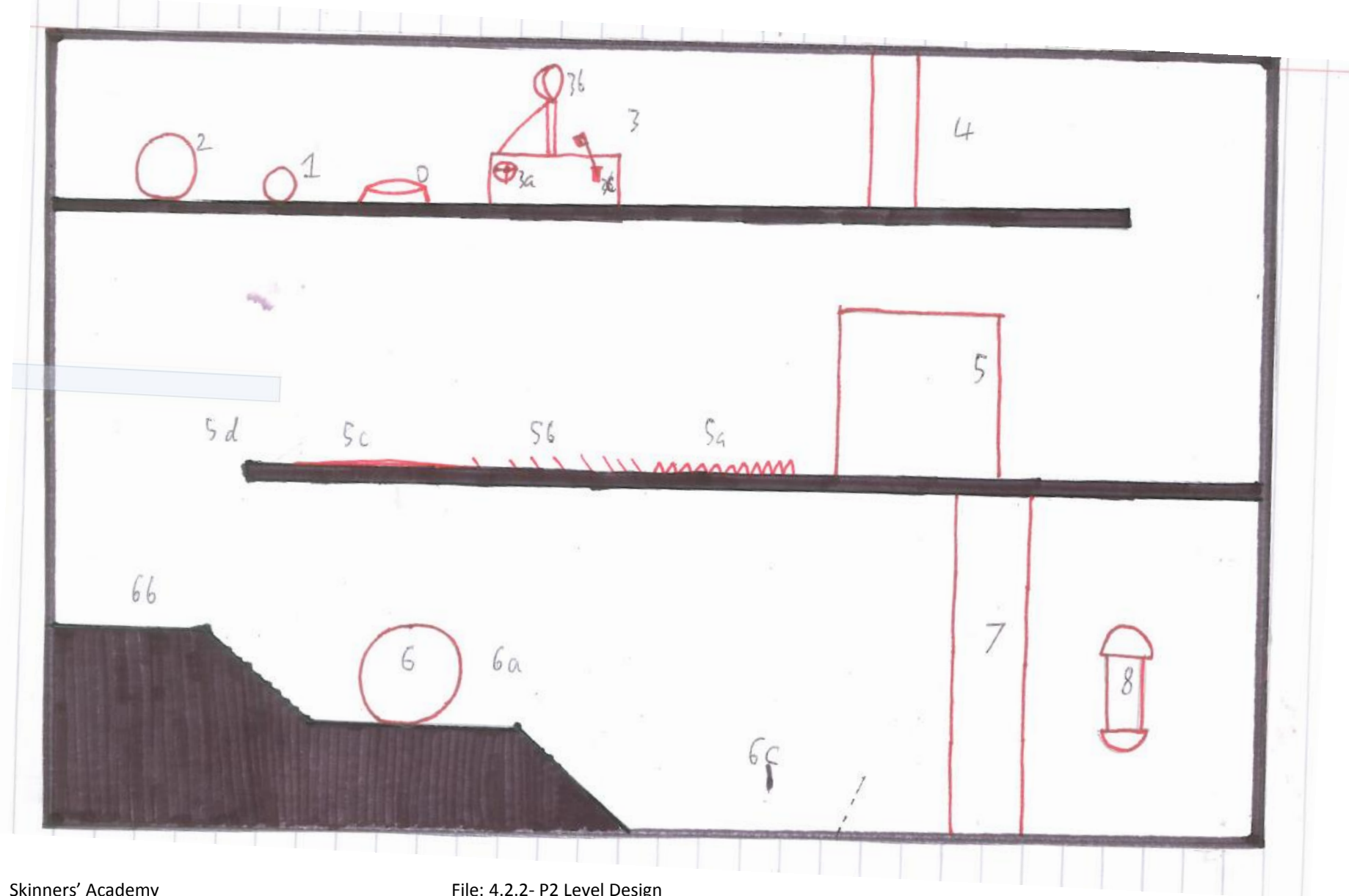
**States:** Off, on

**Can transfer states:** no

**Starting state:** Off

**Algorithm(s):**

animation: teleporter  
If [P2]: {Off};  
Load [Player] in +0 spaces



### **Layout and Mechanics**

1. *Small projectile*: Interact with this object to hold it. While the playable character is in S.projectile state, movement speed will be reduced and they cannot jump.

#### **Name:** Small projectile

**Class:** Hold Object

**States:** Idle, S.projectile

**Can transfer states:** Yes

**Starting state:** Idle

#### **Algorithm(s):**

While: {Idle}; animation: Idle.

If {interacting} occurs within +-1 spaces,  
enter {S.projectile}.

While: {S.projectile}; animation: none,  
Transfer {S.projectile} to player.

While: {S. projectile},  
If {interacting} occurs within +-1 spaces,  
Enter {Idle},  
Transfer {S. projectile} from player.

\*

While [Player]: {S.projectile},  
If left key is pressed: enter {walking},  
While: {left}; animation: r.walking,  
Move object [player] -0.5 spaces.  
If right key is pressed: enter {walking},  
While: {right}; animation: walking,  
Move object [player] +0.5 spaces.  
If up key is pressed: enter {jumping},  
While: {jumping}; animation: jumping,  
Move object [player] +^0 spaces.

2. *Large projectile*: Interact with this object to hold it. While the playable character is in L.projectile state, movement speed will be set to 0.

#### **Name:** Large projectile

**Class:** Hold Object

**States:** Idle, L.projectile

**Can transfer states:** Yes

**Starting state:** Idle

#### **Algorithm(s):**

While: {Idle}; animation: Idle.

If {interacting} occurs within +-1 spaces,  
enter {L.projectile}.

While: {L. projectile}; animation: none,  
Transfer {L. projectile} to player.

While: {S. projectile},  
If {interacting} occurs within +-1 spaces,

Enter {Idle},  
Transfer {S. projectile} from player.

\*

While [Player]: {L. projectile},  
If left key is pressed: enter {walking},  
While: {left}; animation: r.walking,  
Move object [player] -0spaces.  
If right key is pressed: enter {walking},  
While: {right}; animation: walking,  
Move object [player] +0spaces.  
If up key is pressed: enter {jumping},  
While: {jumping}; animation: jumping,  
Move object [player] +^0 spaces.

3. *Catapult*: this object is actually made of 3 separate parts, 3a, 3b and 3c. When the left part is selected for interaction, part 3a will be affected, the first interaction with 3a will change the catapult into a first charge state. The second interaction will change the catapult into a full charged state. If the player interacts with the middle of the catapult (3b) while in S. projectile state while 3 it is not in a charged state, the player will say (I can't reach). If the player tries again with 3 in a charged state, 3 will enter a loaded state (L1 for first charge L2 or full charge). If the player tries to interact with 3c while 3 is not in a loaded state, the player will say (Maybe I need to do something first). If the player interacts with 3c while in L1 state 3 enters a weak launch state for 3 seconds causing a launching animation and then resetting all states. If the player interacts with 3c while in L2 state, then the catapult enters strong launch state, followed by a broken state (all state changes will have associated animations)

## **Name:** Catapult

**Class:** Interactive Object

**States:** Idle, first charge, full charge, S.projectile, L1, L2, weak launch, strong launch

**Can transfer states:** Yes (can hold multiple states)

**Starting state:** Idle

**Algorithm(s):**

While: {Idle}; animation: Idle.

### **3a**

If {interacting} occurs within +-1 spaces,  
enter {first charge}.  
While: {first charge}; animation: first charge.  
If {interacting} occurs within +-1 spaces,  
While: {first charge},  
enter {full charge}.  
While: {full charge}; animation: full charge

### **3b**

If {interacting} occurs within +-1 spaces,

Skinner's Academy

Centre Number: 10438

File: 4.2.2- P2 Level Design

While: {Idle},  
While: [Player]: {S charge},  
[Player] speak (I can't reach.).  
If {interacting} occurs within +-1 spaces,  
While: {first charge},  
Transfer {S.charge}.  
Enter {L1}  
While: {L1}; animation: L1.  
If {interacting} occurs within +-1 spaces,  
While: {full charge},  
Transfer {S.charge}.  
Enter {L2}  
While: {L2}; animation: L2.

### 3c

If {interacting} occurs within +-1 spaces,  
While: {L1},  
Enter {weak launch},  
While: {weak launch}; animation: weak launch.  
If {interacting} occurs within +-1 spaces,  
While: {L2},  
Enter {strong launch},  
While: {strong launch}; animation: strong launch.

4. *Shabby wall*: When 3 enters a strong launch state, 4 will enter a broken state. While in this state 4 changes it's interactions and its animation to allow the player to pass through.

### **Name:** Shabby wall

**Class:** Reactive Object

**States:** Idle, Broken

**Can transfer states:** no

**Starting state:** Idle

**Algorithm(s):**

While: {Idle}; animation: Idle,  
Mimic {[platform]}.  
If [Catapult]: {L1},  
enter {Broken}.  
While: {Broken}; animation: Broken.  
Mimic {[none]}

5. *Big box*: Starts with the same class as a platform, when interacted with enters a pushed state: when the player walks into it, it will move with varying speed depending on its surface. 5a is a rough surface halving 5's movement speed. 5b is a smooth surface doubling 5's movement speed. 5c is a normal surface affecting 5's movement speed. When 5 hits 5d (the edge of the platform) 5 will enter a freefall state, this will trigger an animation and remove it from the level.

**Name:** Big Box

**Class:** Hold Object

**States:** Idle, rough, smooth, normal, Broken

**Can transfer states:** Yes

**Starting state:** Idle

**Algorithm(s):**

While: {Idle}; animation: Idle.

mimic {[ platform]}.

If {interacting} occurs within +-1 spaces,  
enter {rough}.

[Player]: {rough}.

While: {rough};

If [Player] moves -5 spaces  
enter {smooth}.

[Player]: {smooth}.

While: {smooth};

If [Player] moves -5 spaces  
enter {normal}.

[Player]: {normal}.

While: {normal};

If [Player] moves -5 spaces  
Enter {broken}.

[Player]: {None}

While: {Broken}; animation: Broken.

Mimic {[none]}

If {interacting} occurs within +-1 spaces,  
Enter {Idle},

Transfer {rough, smooth, normal} from player.

6. *Boulder*- When interacted with, the player will enter pushing state, in pushing state, moving left or right will push the boulder into that direction. If the boulder is pushed to position 6a in will enter a roll state and roll to position 6c, this will remove 6a from the level. If the boulder is moved to poison 6c then object 6 will enter a crash state, this causes 6 and the character to enter a special animation. After the crash state, 6 cannot be interacted with.

**Name:** Boulder

**Class:** Hold Object

**States:** Idle, pushing, roll, crash

**Can transfer states:** Yes

**Starting state:** Idle

**Algorithm(s):**

Skinner's Academy

Centre Number: 10438

File: 4.2.2- P2 Level Design

While: {Idle}; animation: Idle.  
If {interacting} occurs within +-1 spaces,  
enter {pushing}.  
[Player]: {pushing}.  
While: {pushing};  
If [Player] moves +5 spaces  
enter {roll}.  
[Player]: {none}.  
While: {roll}; animation: roll.  
[Boulder] Move +15 spaces.  
If {interacting} occurs within +-1 spaces,  
Enter {Idle},  
Transfer {roll} from player.  
While: {Pushing},  
If [6b] occurs within +-1 spaces,  
While: {crash}; animation: crash  
[Boulder] Move +50 spaces.

7. *Glass Wall*- Starts in unbroken state, while in this state functions like a normal platform, blocking the player. When object 6 enters a crash state, 7 will enter a broken state. While in this state 7 changes its interactions and its animation to allow the player to pass.

**Name:** Glass wall

**Class:** Reactive Object

**States:** Idle, Broken

**Can transfer states:** no

**Starting state:** Idle

**Algorithm(s):**

While: {Unbroken}; animation: Unbroken

Mimic {[platform]}.

If [Boulder]: {crash},  
enter {Broken}.

While: {Broken}; animation: Broken.

Mimic {[none]}

8. *Battery*: When the player touches 8 the level instance enters a win state. This will end and lock the instance while opening the neutral area in a P2 clear state (This will change certain visuals of the neutral area).

**Name:** P2 Battery

**Class:** Stage Object

**States:** On, Off, Win

**Can transfer states:** no

**Starting state:** On

**Algorithm(s):**

While: {On}; animation: On.

If [Player] enters +-0 spaces,  
enter {Off}.

While: {Off}; animation: Off.

If {Off},

Wait 5seconds

enter {Win}.