2016
ROBOTICS COMPETITION
CHALLENGE DOCUMENT

wonder league 2016

Ages 9-12

# Animal Habitat Rescue
Age Bracket 9-12

The **Wonder League** has 5 very important missions that only you and your fearless team of friends can help with. Animals on faraway **Bear Byte Island** called our emergency line, and Dash is the perfect little robot to save the day. Your team will write code to help navigate Dash around the island and rescue animal habitats. Your missions await!

All animal habitat rescuers must submit your missions back to Wonder League Headquarters at clubs. makewonder.com by **December 15, 2016. 11:59pm PST**. You must take a video of your robot completing each mission and also your Wonder Key. Check each mission for video submission details.

The first step is to make a **150cm** by **240cm** grid. Each grid line is **30cm** apart. You can use painter's tape to tape down the grid (you can put tape on a tarp or vinyl fabric for better portability) or purchase one at our **store**.

- Label the rows from the bottom to top with **A** through **E**
- Label the columns from the left to right using **1** through **8**.

You must use the Wonder app to complete all missions.
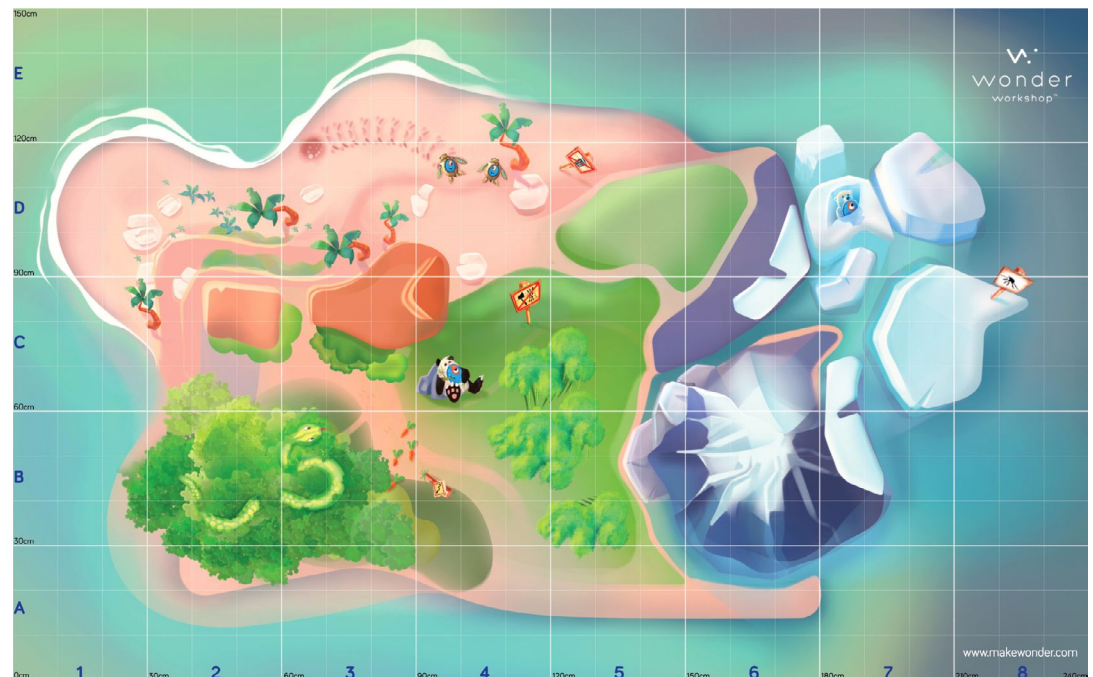
Mission 1: **Animal Mimicry**

Dash needs to explore the island to find out where animals are without disturbing them! Help Dash visit four places to record and play back the unique sounds of an exotic species.

What you need

- Dash
- Your tablet

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Dash's starting place: C1

E							
D		■		■			
C							
B		■		■			
A							

1 2 3 4 5 6 7 8

Animal Mimicry
Your mission

Make Dash move to B3, B5, D3, and D5. You can move to these locations in any order. At each cell, make Dash

1. Turn on a Red light
2. Wait 1 second
3. Turn on a Green light
4. Play an animal sound

20 points max

5 points for turning on the red light, green light, and animal sound at **B3**

5 points for turning on the red light, green light, and animal sound at **B5**

5 points for turning on the red light, green light, and animal sound at **D3**

5 points for turning on the red light, green light, and animal sound at **D5**

RULES

- Most of Dash's body has to be in the target cell when the sound is played.
- Don't make Dash go outside the grid!

JUST 4 fun

Dress Dash up as an animal to complete Dash's disguise.

You can use the animal sounds included in the Wonder app, or you can create your own! Research sounds that animals make, and record custom sounds for Dash to play

Mission 2: **Tower of Trash**

An epic tower of burning trash is threatening the favorite birthing spot of the blue-bellied beach bowl, an endangered species of sea turtle. Help Dash shove the burning trash mountain off the beach before the baby turtles are born.

What you need

- Dash
- Your tablet
- Dot
- 2 Solo cups – 18 oz size

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- Put 1 cup upside down in the center of D3.
- Put 1 cup upside down in the center of D4.

Dash's starting place: **C1**

```
E
D        ●   ●
C    🔵
B
A
   1  2  3  4  5  6  7  8
```

Tower of Trash
Your mission

1. Randomly put Dot (the pregnant sea turtle) on top of one of the cups. The other cup represents the burning garbage on the beach.

2. You don't know where the sea turtle will decide to give birth, so your program needs to work for both locations.

3. Make Dash find the garbage cup and push it into Row E.

TIP

Test your program! Try putting Dot on the cup at D3 and then run your code. Then try putting Dot on the cup at D4 and run the same program again. Does it work both times? What sensors do you need to use to check to see where Dot is?

In your submission video, run your program twice. Once where the sea turtle is at D3 and once where the sea turtle is at D4. They must use the same code.

RULES

You can't disturb the pregnant sea turtle! Don't knock Dot off the cup or move Dot's cup out of the cell.

JUST 4 fun

Dress Dot up as a turtle.

40 points max

20 points for pushing the garbage cup from **D3** completely into **Row E**

10 points for pushing the garbage cup from **D3** only partially into **Row E**

20 points for pushing the garbage cup from **D4** completely into **Row E**

10 points for pushing the garbage cup from **D4** only partially into **Row E**

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Mission 3: **Rabbit Rescue**

Dash's next stop is to the forest to save a rare species of rabbit called the one-eyed round-bodied bluebunny, who is being threatened by a rapidly growing invasive species of pythons that have a special taste for bunny meat. Help Dash create a conservation area so that the bunnies can frolic without fear!

What you need

- Dash
- Your tablet
- Dot
- 1 Solo cup - - 18 oz size

5

Dash's starting place: C1

Your mission

1. Randomly put 1 cup upside down in the center of B3, B4, **or** B5. Place Dot (the bunny) on top of the cup.

2. You don't know where the bunny will be so, your program needs to work for all three locations.

3. Make Dash orbit around Dot's cup at least 3 times.

TIP

Test your program! Try putting Dot and the cup at B3 and then run your code. Then try B4 and run the same program again. Then try B5. Does it work all 3 times? What sensors do you need to use to check to see where Dot is?

RULES

- You can't disturb the bunny! Don't knock Dot off the cup or move Dot's cup out of the cell.
- Don't make Dash go outside the grid!

In your submission video, run your program three times. Once where the bunny is at B3, once where the bunny is at B4, and once where the bunny is at B5. They must use the same code.

SCORE

45 points max

5 points for each full orbit around Dot at **B3 (max 3 orbits)**

5 points for each full orbit around Dot at **B4 (max 3 orbits)**

5 points for each full orbit around Dot at **B5 (max 3 orbits)**

JUST 4 fun

Dress Dot up as a bunny.

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Mission 4: **Polar Bear Problems**

Dash's next stop is an arctic coastal tundra. The ice is melting, and a mama polar bear is stuck on a piece of ice that's drifting out to sea as she was out hunting for food. Help Dash reunite the polar bear with her baby by pushing the iceberg back to land.

What you need

- Dash
- Your tablet
- Dot
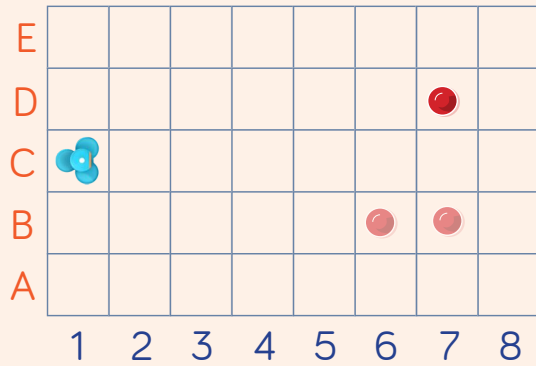- 2 Solo cups – 18 oz size

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- Put 1 cup upside down in the center of D7. This cup is the momma bear.

Dash's starting place: **C1**

Polar Bear Problems
Your mission

1. Randomly put 1 cup upside down in the center of B6 or B7 and put Dot on top. Dot is the bear cub.

2. You don't know where the bear cub will be so, your program needs to work for both locations.

3. Make Dash find the momma bear and push her closer to the bear cub.

   If the bear cub is at B6, push the momma bear to B7

   If the bear cub is at B7, push the momma bear to C7

TIP
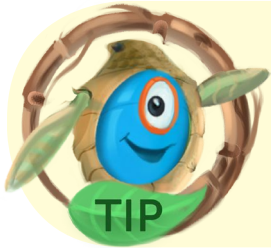
Test your program! Try putting Dot on the cup at B6 and then run your code. Then try putting Dot on the cup at B7 and run the same program again. Does it work both times? What sensors do you need to use to check to see where Dot is?

In your submission video, run your program twice. Once where the bear cub is at B6 and once where the bear cub is at B7. They must use the same code.

RULES
- Don't disturb the bear cub! Don't knock Dot off the cup or move Dot's cup out of the cell.
- Don't make Dash go outside the grid!

JUST 4 fun

Dress Dot up as a polar bear cub

SCORE

50 points max

25 points for pushing the momma bear cup completely into **B7**

10 points for pushing the momma bear cup only partially into **B7**

25 points for pushing the momma bear cup completely into **C7**

10 points for pushing the momma bear cup only partially into **C7**

Mission 5: **Trial by Fire**

A raging fire is spreading across the Bamboo Forest, home of the giant panda! A baby panda has climbed a tree to hide from the flames. Help Dash put out the fires and save the baby panda!

What you need

- Dash
- Dot
- 3 Solo cups – 18 oz size
- Your tablet
- 2 ping pong balls (or Launcher balls)
- Materials to build an attachment for Dash to knock the balls off the cups
  (suggestion: you can use Building Brick Connectors and Lego bricks for this)

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- Put 3 cups upside down at B5, C4, and C5.

- Make Dash an arm that can knock a ball off an upside down cup.

Dash's starting place: C1

E
D
C
B
A
1 2 3 4 5 6 7 8

Trial by Fire
Your mission

1. Randomly put Dot (the baby panda) on top of one of the cups. The other cups represent the burning trees. Place the ping pong balls on top of the other two cups.

2. You don't know where the baby panda will try to hide, so your program needs to work for all locations where the fires can be.

3. Make Dash find the cups with balls and knock the balls off to put out the fires.

TIP

Test your program! Try putting Dot on the cup at B5 and then run your code. Then try C4 and run the same program again. Then try C5. Does it work all 3 times? What sensors do you need to use to check to see where Dot is?

In your submission video, run your program three times. Once where the baby panda is at B5, once where the baby panda is at C4, and once where the baby panda is at C5. They must use the same code.

SCORE

60 points max

10 points for each cup with a ball knocked off of it when Dot is at **B5**

10 points for each cup with a ball knocked off of it when Dot is at **C4**

10 points for each cup with a ball knocked off of it when Dot is at **C5**

RULES

- Don't knock the baby panda out of the tree! Don't knock Dot off the cup or move Dot's cup out of the cell.
- Don't spread the fire! Don't move the other cups out of their cells.
- You can't move Dash with your hands at any time.
- Don't make Dash go outside the grid!

JUST 4 fun

Dress Dot up as a baby panda.