Dash

A Guide for Parents and Educators

Enoch Hunsaker
Brigham Young University
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About Dash

Dash is a programmable robot that can be used in the classroom or at home to help children learn to code. It can also be integrated into learning activities with a variety of other subjects, including (but not limited to) science, math, language arts, social studies, and the arts.

Dash-Stats	
Best for Ages (Grades)	4-11 (PreK-6th)
Motor & Hand-Eye Skills Needed	• Press physical button • Press a touchscreen • Drag & drop on a touchscreen
Language Skills Needed	• Recognize & select symbols • Read simple words (Blockly & Wonder)
Cognitive Skills Needed	• Recognize cause & effect patterns (e.g., "If I push this button, the robot reacts in this way")
Use with a Smart Device	Required
Compatibility: More Info: http://bit.ly/2rS83Ui	✓ iOS ✓ Android ✓ Kindle
Connectivity Requirements	Bluetooth only
Battery Recharge Time	90 minutes
Battery Duration	2-3 hours
Accessories	Yes (http://bit.ly/2KE2f81)
Pricing	See store: http://bit.ly/2rVHSey

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Setup Instructions

What's In the Box?

The following video may help you understand the purpose of all the items you see in the Dash box.

Video 1. Unboxing Dash. Click, copy, or type this link into your browser to view: https://youtu.be/vDA2sT2qVZ0?t=39s. ***Note:*** *This video is copyrighted by Wonder Workshop under a Standard YouTube License. It is therefore not included the CC-BY license for the rest of this document.*

Dash Apps - and How to Connect

Before using Dash with a mobile device, you will need to make sure that you have a compatible device (http://bit.ly/2rS83Ui) and that Bluetooth is enabled on it. If you need help figuring out how to enable Bluetooth on your specific device, try Googling "How to enable bluetooth on ____", replacing the blank with the name and model of your device.

You will **not** need internet connectivity to connect to Dash or to run the apps once they are installed. (You will need to connect to the Internet to download the apps the first time.)

There are 5 apps you can use with Dash: Go, Path, Xylo, Blockly, and Wonder. For an introduction to each of these apps, and instructions for how to connect to them, watch

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the video below. You can also reference this document (http://bit.ly/2s2yy8P) for an overview of the different apps.

Video 2. App Overview from Wonder Workshop. Click, copy, or type this link into your browser to view: https://youtu.be/vxXIMqX2F78. **Note:** *This video is copyrighted by Wonder Workshop under a Standard YouTube License. It is therefore not included the CC-BY license for the rest of this document.*

Inner Workings of Dash

You may find the following video helpful, both for your own understanding and for teaching your students about general robot functionality.

Video 3. Robot Guts. Click, copy, or type this link into your browser to view: https://youtu.be/g8idCcNeIQg. **Note:** *This video is copyrighted by Wonder Workshop under a Standard YouTube License. It is therefore not included the CC-BY license for the rest of this document.*

Charging, Care, & Maintenance of Dash

The following facts may be useful as you consider how to use Dash in your classroom and how to ensure it is cared for properly. The following points come from this video (https://youtu.be/zXlp_mzMxL0) by Wonder Workshop:

- Dash has a rechargeable battery that lasts 2-3 hours and takes approximately 90 minutes to fully charge. Dash cannot be overcharged, so it is ok to keep it plugged in overnight, or even whenever it is not in use. Dash powers down automatically after 15 minutes of non-use.
- Robots running low on battery will give a notification in the app while in use. The power button on the robot itself will also start cycling between bright and dim.
- Don't use water or cleaning solutions on Dash. The best way to clean Dash is with a dry, lint-free cloth.
- Dash is durable, but not indestructible. Don't purposely try to make it crash or fall.
- It's best to hold Dash by the bottom rather than by the head.
- It's a good idea to check the wheels periodically to make sure nothing has gotten lodged in them.

Troubleshooting Dash

If you're having trouble getting Dash and Dot to work, please refer to the manufacturer's troubleshooting tips (http://bit.ly/2kbhnOK).

Teacher-to-Teacher Tips for Using Dash in the Classroom

- When working with younger children, it's probably best to have them use larger (e.g., iPad-size) screens rather than smaller screens to control Dash. Little fingers with less-refined motor skills are more successful that way.
- Make sure the area in which you're using Dash is fairly free of obstructions. Dash is sturdy, but you don't want to try to crash it into things on purpose, and it can be difficult to control with exact precision.
- Older children will find more versatility in coding with the Blockly app, but younger children may find the more visual language of the Wonder app easier to work with.

Using Dash in Developmentally-Appropriate Ways

If you are using Dash with young children, it is important to recognize how developmentally-appropriate practice (DAP) applies to the use of this robot. For most of the decisions you make, you will need to rely on your informed professional judgment to determine if the practice is developmentally-appropriate for your students (NAEYC and Fred Rogers, 6). You may find the following guidelines useful.

- **Interactive Use**. Activities in which children use Dash, like activities with any other technology, should be structured to be *interactive*. In other words, they should encourage both active creativity and "social engagement with other children and adults" (NAEYC and Fred Rogers, p. 1). You may consider using strategies such as pair programming (https://youtu.be/vgkahOzFH2Q) to encourage such interaction. Furthermore, you may consider using the following types of student-teacher interaction, which have been documented in past research studies to produce effective results:
  - *Modeling.* Teachers demonstrate tasks (Highfield, 2015).
  - *Releasing Responsibility Gradually.* Start with direct instruction, move to a simple guided activity, then issue an open-ended challenge or problem (Buss and Gamboa, 2017). Continue to guide behavior, even while working/playing as a team (Highfield, 2015).
  - *Encouraging*. Insofar as possible, teachers should provide "encouragement and problem-solving hints and tips," rather than outright answers (Buss and Gamboa, 2017).
  - *Questioning*. Rather than providing answers directly, teachers should ask "probing questions" before, during, and after learning activities (Buss and Gamboa, 2017; See also Highfield, 2015) These questions should encourage students to reflect on their learning (Buss and Gamboa, 2017).
  - *Fostering alternative problem-solving.* Teachers should promote alternative ways of modeling a problem (Buss and Gamboa, 2017), such as drawing out solutions on paper, discussing alternative solutions as teams, or relating challenges to more familiar circumstances.

- **Social Coaching.** Since use of technology such as the Dash robot needs to be interactive to be developmentally-appropriate, teachers should be aware that they

may need to provide social coaching to children in these collaborative activities (Bredekamp and Copple, 116).

- **Time for Exploration.** Expect toddlers to manipulate the robot and explore its features, but not necessarily to produce complete coded programs. (Bredekamp and Copple, p. 85). Older children can code complete programs once they are ready. Even for older children, it may be important to provide time to explore and "play" with the robots, allowing them to "follow their own interests" (Bredekamp and Copple, pp. 127-128).

- **Activity Length.** Children under 4 often fatigue quickly if extended periods of eye-hand coordination are required (Bredekamp and Copple, p. 105). Furthermore, there is some concern about the appropriateness of too much use of any screens for very young children. For these reasons, you may wish to keep Dash activities with very young children short.

- **Sanitation.** Robots and devices should be cleaned appropriately for safety and sanitation (Bredekamp and Copple, p. 88). Refer to the [Charging, Care, & Maintenance](#) section above for instructions on how to clean Dash.

- **Device Regulation.** Smart devices used to control the robots should be configured so that children can only access specific, approved apps. This helps reduce distraction as well as potential problematic exposure to undesirable material and media.

- **Curriculum Integration.** Using the Dash robot should not be merely an isolated or "fun Friday" experience. Rather, teachers should integrate Dash into core subjects and help students transfer their learning to other contexts and subject areas (Bredekamp and Copple, p. 130). Several ideas for integration with other subject areas can be found in the [Cross-Curricular Connections with Dash](#) section below.

Teaching Coding with Dash

You can teach a variety of coding concepts using Dash. What you can teach varies by the app that you use. Refer to the table below for more information. To better understand the coding concepts highlighted below, you may consider earning the Teaching Early Coding - Level 1 (http://bit.ly/2wlQjFN) and Teaching Early Coding - Level

2 (http://bit.ly/2xadOC4) badges, or at least viewing the instructional guides for these badges.

	Go	Path	Xylo	Blockly	Wonder
Best for Ages	*Pre-Readers*	*Pre-Readers*	*All*	*Readers*	*Readers*
Commands	✓	✓	✓	✓	✓
Loops				✓	✓
Nested Loops				✓	✓
Events		✓		✓	✓
Conditionals				✓	
While Loops				✓	✓
For Loops				✓	
Variables				✓	
Functions				✓	

Advanced Coding Concepts

If you have earned (or are earning) either or both of the Teaching Early Coding badges, you may wonder how to teach functions, parameters, and operators with Dash. Creation of these structures is severely limited with the Dash robot, so they will not be covered in great depth in this guide. You may, however, find the following information useful:

Parameters

Although some of the commands within the Blockly and Wonder apps allow you to manipulate built-in parameters, you are not able to establish new parameters within a function. For example, you could mention to students that they are manipulating *parameters* when they change the angle at which Dash looks or the distance that Dash moves. However, you would not be able to add a new parameter not already built into the function.

Operators

A few assignment and arithmetic operators (<, >, =, ≠, +, -, x, ÷) are available when setting and comparing variables in the Blockly app.

Short Tutorials

Each of the following videos is less than 2 minutes and highlights how to utilize a particular coding concept with Dash. You may find them useful both for applying your own coding knowledge and for teaching students these concepts.

Commands with Dash (All Apps)

Video 4. Commands with Dash (All Apps). Click, copy, or type this link into your browser to view: https://youtu.be/SAM5YPS2p3w. ***Note:*** *This video by IPT Instructor is released to the Creative Commons under a CC-BY License.*

Events with Dash (Path, Blockly, & Wonder Apps)

Video 5. Events with Dash (Path, Blockly, & Wonder Apps). Click, copy, or type this link into your browser to view: https://youtu.be/twH7ZrPFjhQ. *Note: This video by IPT Instructor is released to the Creative Commons under a CC-BY License.*

Loops with Dash (Blockly App)

Video 6. Loops with Dash (Blockly App). Click, copy, or type this link into your browser to view: https://youtu.be/ooUTAC7XR64. *Note: This video by IPT Instructor is released to the Creative Commons under a CC-BY License.*

Loops with Dash (Wonder App)

Video 7. Wonder Tutorial: Using Loops. Click, copy, or type this link into your browser to view: https://youtu.be/Q-QrgIAut1g. ***Note:*** *This video is copyrighted by Wonder Workshop under a Standard YouTube License. It is therefore not included the CC-BY license for the rest of this document.*
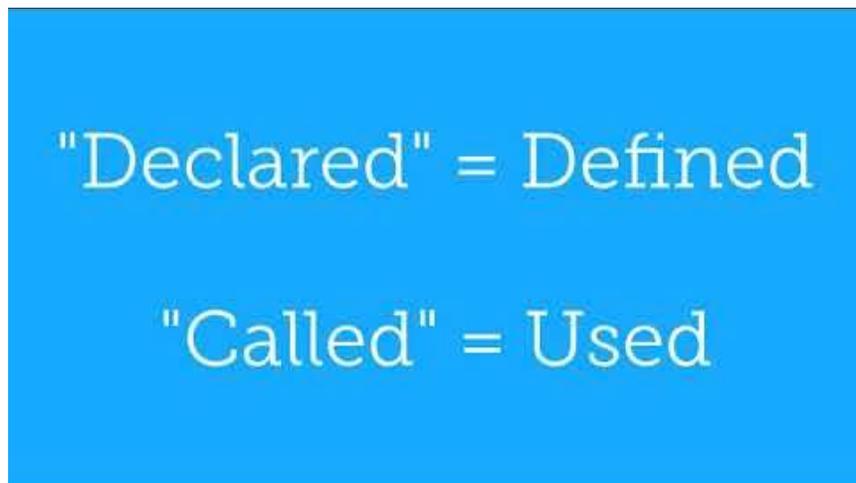
Conditionals with Dash (Blockly App)

Video 8. Conditionals with Dash (Blockly App). Click, copy, or type this link into your browser to view: https://youtu.be/Wrm5N7Zfzw4. ***Note:*** *This video by IPT Instructor is released to the Creative Commons under a CC-BY License.*

Variables with Dash (Blockly App)

Video 9. Variables with Dash (Blockly App). Click, copy, or type this link into your browser to view: https://youtu.be/op5rs0sMUCo. *Note: This video by IPT Instructor is released to the Creative Commons under a CC-BY License.*

Functions with Dash (Blockly App)

Video 10. Functions with Dash (Blockly App). Click, copy, or type this link into your browser to view: https://youtu.be/Vv1KPugsMi0. *Note: This video by IPT Instructor is released to the Creative Commons under a CC-BY License.*

Cross-Curricular Connections with Dash

Dash is fun on its own and is really great for helping kids learn to code. However, much of Dash's potential involves integrating these robotic and coding concepts with other aspects of the core curriculum. Whether you are a parent, an elementary or ECE teacher, or even a secondary teacher trying to figure out how coding and robotics can apply in your classroom, learning how to integrate Dash within your regular core curriculum can be an enriching experience for both you and your students and can help students to transfer their knowledge between domains.

Dash can be effectively used to reinforce and enrich learning in a variety of subject areas, including (but not limited to) the following:

- Science
- Math
- English Language Arts
- Social Studies
- Arts

One of the best ways to get ideas for how to integrate Dash into your subject area is to visit Wonder Workshop's Code to Learn lesson plans web page (https://goo.gl/QeR5sG).   Here, you can filter results by subject area (it includes each of the categories above), grade level, and the robots/accessories you have.   You can also add lesson plans for other teachers to use. To access this page, click on the link above or use the QR code below:

Additional Resources

- Wonder Workshop's [Curriculum Guides](https://education.makewonder.com/curriculum)
  (https://education.makewonder.com/curriculum)
- Wonder Workshop's [Teacher's Guide](https://education.makewonder.com/assets/files/resources.pdf)
  (https://education.makewonder.com/assets/files/resources.pdf)
- Wonder Workshop's [Professional Development Course](https://education.makewonder.com/professional-development)
  (https://education.makewonder.com/professional-development)

Teaching with Dash: Quick Start Guide

About Dash

Best for Grades	PreK-6th
Motor Skills Needed	● Press button ● Swipe/Drag on a touchscreen
Language Skills Needed	● Recognize & select symbols ● Read simple words (Blockly & Wonder)
Battery Duration	2-3 hours
Recharge Time	90 minutes
Mobile Platforms	Apple, Android, Kindle
Connectivity Req.	Bluetooth only

Connect to Device

On Dash:

1. Press the white power button on the robot's side.

On Device:

2. Enable Bluetooth

3. Open the desired App*

4. Touch + button in top right

5. Select the desired robot
6. Update robot if prompted

Troubleshooting

Wonder's Help Page:
https://goo.gl/XAcvzV

*Choosing an App

Go. *PreK-1*. Control movement, lights, and sounds on Dash like a remote-controlled vehicle.

Path. *PreK-1*. Draw a path for dash to travel and intersperse commands along the way.

Xylo. *Pre-K-6th.* Compose original music using the xylophone accessory on Dash.

Blockly. *2nd-6th.* Use Google's block-based coding language to write a program for Dash.

Wonder. *2nd-6th* Use Wonder's state-machines coding language to write a program for Dash.

Teacher-to-Teacher Tips

● Use larger screens over smaller screens (e.g., iPad over iPod) for little fingers.

● Clear a fairly large area of obstructions before using Dash.

● Consider using Blockly for older kids and Wonder for younger kids.

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References

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