# Worksheet 9: Broadcast

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| **Learning Intentions**: We are learning to be able to … |
| Broadcast messages between objects |
| *Why are we learning this?* |
| So that we can reuse bits of code by calling them when we need them, thus making our programs more modular |
| **Success Criteria**: I will be successful if I can … |
| * Send a message to another object * Receive and act on a broadcast message |

## Instructions:

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| Acquire and integrate knowledge: |
| 1. *Import* the Computer and Switch images as separate sprites into a new Scratch project, and draw a circle to represent a “packet” of data (also in a new sprite):        1. Name the switch and packet sprites… but name the computer with a unique “IP Address”, in this case 192.168.1.1 2. On the packet sprite, create three variables that will be used *for all sprites* – **data**, **destination** and **source**:   Model_Net_2.png   1. On the computer sprite (currently named 192.168.1.1), add script:   **Hint**: you’ll have to create a **new** *broadcast* message to make this work:     1. Duplicate the computer sprite a couple of times, each time altering:    1. The name of the sprite (e.g. 192.168.1.2, 192.168.1.3, etc.)    2. The code block that contains the *set source* script – make sure it matches the same name of the computer it is attached to 2. Back on the packet sprite, add the following script: 3. You have simulated a model of a LAN. What does LAN stand for? (in computing terms, use Google if you have to) –   Click here to enter text.   1. How did the **broadcast** message block make it easier to duplicate the computers?   Click here to enter text.   1. Define these basic networking terms using Google:    1. Router: Click here to enter text.    2. Hub: Click here to enter text.    3. Switch: Click here to enter text.    4. Bridge: Click here to enter text.    5. Modem: Click here to enter text. 2. Explain what is contained in the basic 3 sections of a network packet of data (use <https://computer.howstuffworks.com/question5251.htm>):    1. Header: Click here to enter text.    2. Payload: Click here to enter text.    3. Trailer: Click here to enter text. |
| Extend and refine knowledge: |
| 1. On a new Scratch document, *import* the **computer**, **router** and **switch** images into separate sprites. There is no code on these:        1. Draw a new sprite named cable. It has two costumes, *ethernet* and *fibre*: 2. In the *Scripts* tab for the cable, make a new variable *for all sprites* called cable\_speed, and add the following script:      1. Import the **mobile** image into a new sprite (and name it mobile). In the *Scripts* tab for the mobile, make a new variable *for all sprites* called wireless\_speed, and add the following script:      1. Finally, draw a circle (in a new sprite) to represent a **packet** of data. Name it **packet**, and add the following script:      1. You may have to do some calculations based on your own experience with network speeds in your area, as to the ratio of how much faster Ethernet / fibre / 4G / WiFi are (in comparison to eachother). Sometimes ISP’s cap speeds, other times network congestion can really affect your average speed. For example:  |  |  |  | | --- | --- | --- | | Technology | My Average Speed | Multiplier in Scratch | | Ethernet | 100 Mbps | 1 | | Fibre optic | 400 Mbps | 2 | | 4G | 250 Mbps | 2.5 | | WiFi | 150 Mbps | 1.5 |   I ended up doubling my multiplier in Scratch – as long as the animation is relative, it’s ok.  Research and adjust your own personal relative speeds in Scratch, then paste screen a shot of your completed script here.   1. What other wireless or wired technologies are there, whether they exist now or in development (e.g. 5G). Make a list here and their relative speeds:   Click here to enter text. |
| Use knowledge meaningfully: |
| 1. Discuss the advantages and disadvantages of a wireless and wired network.   Click here to enter text.   1. Imagine a small elevator / forklift style “bucket” with 3 buttons to control it in a warehouse:     Use **broadcast** messages to remotely control the “bucket” using the 3 on-screen buttons.  Paste completed script here. |