

Word Magic Teacher Guide



Summary

- | | |
|----------------------------|--|
| ● Coding skill level: | Advanced |
| ● Recommended grade level: | Grades 6-12 (U.S.), Years 7-13 (U.K.) |
| ● Time required: | 50 minutes |
| ● Number of modules: | 1 module |
| ● Coding Language: | JavaScript |

Teacher Guide Outline

Welcome!

- How to Prepare

Activity

- Overview
- Getting Started (20 minutes)
- DIY Modules (30 minutes)
- Extended Activities

Going Beyond an Hour

- Do More With Tynker
- Tynker for Schools

Help

Welcome!

In this cross-curricular lesson, students will apply Reading and coding concepts as they create a visually expressive art project that showcases a word's definition, etymology, root words, and more! Students will begin by completing a worksheet to help them collect information about a word of their choosing before they start coding. Once students finish the worksheet, they're ready to move on to the "Word Magic" DIY module. The DIY module includes a step-by-step tutorial, 2 sample projects, and ideas on how students can showcase their word. Towards the bottom of the tutorial, students are provided code snippets of useful functions and variables that they can use. Once students finish their project, they will reflect on today's coding adventure as they complete the "Extended Activities" section of this teacher guide.

Important: Note that this project is open-ended. Students are provided suggestions and code snippets to help them get started, but will need to code on their own. It is recommended that you complete this lesson in two different parts (as noted in the "How to Prepare" section of this teacher guide).

How to Prepare

This activity is designed for self-directed learning. Your role will be to help students individually and facilitate as students complete the coding activities on their own. The best way to prepare is to:

1. **Familiarize yourself with the material.** After selecting your Tynker lesson (Word Magic), read through the teacher guide and complete the activity before assigning it to students. This will allow you to troubleshoot anything in advance and plan for potential questions from your students.
2. **Sign up for a teacher account.** Creating a free teacher account will allow you to access teacher guides, answer keys, and tons of additional resources. You'll also be able to create free accounts for your students, monitor their progress, and see their projects.
3. **Create student accounts.** From your teacher account, you can easily create free student accounts for all your students. This will allow them to save their projects and progress, so they can continue coding when they get home!
4. **Complete this lesson in two different parts.** Please refer to the "Getting Started" section of this teacher guide.

Activity

Overview

Objectives

Students will...

- Research a word to find out its definition, root word(s), and etymology
- Demonstrate an understanding of Reading concepts such as prefix, root word, suffix, definition, syllable, and parts of speech (for example, verb, noun, adjective)
- Use JavaScript and p5.js to create an expressive word art project called "Word Magic"

Materials

- **For web:** Computers, laptops, or Chromebooks (1 per student)

Vocabulary

- **JavaScript:** JavaScript is a text-based programming language that is widely used in web development
- **p5.js:** A JavaScript library used for creating interactive graphics and animations in a web browser
- **Code:** The language that tells a computer what to do
- **Sequence:** The order in which steps or events happen
- **Command:** A specific action or instruction that tells the computer to do something
- **Loop:** An action that repeats one or more commands over and over
- **Function:** A set of known actions that the computer can perform
- **Variable:** A memory location that is used to store data in a program. The value of variables can vary, or change
- **Prefix:** The beginning of a word
- **Root word:** A word that has nothing added to the beginning or the end
- **Suffix:** The ending of a word
- **Syllable:** The smallest unit of sound in a word — for example the word syllable has three syllables, **syl·la·ble**
- **Noun:** A word used to name a person, place, thing, or idea
- **Adjective:** A word that describes or modifies a noun
- **Verb:** A word that expresses actions or states of being
- **Etymology:** The history and origin of a word

U.S. Standards

- **CCSS-ELA:** RI.6.4, RI.6.7, SL.6.1, RI.7.4, SL.7.1, SL.8.1, RI.8.4, RI.9-10.5, RI.11-12.6
- **CCSS-Math:** MP.1
- **CSTA:** 2-AP-13, 2-AP-17, 3A-AP-13, 3A-AP-17
- **CS CA:** 6-8.AP.13, 6-8.AP.16, 6-8.AP.17, 9-12.AP.12, 9-12.AP.16
- **ISTE:** 1.c, 1.d, 4.d, 5.c, 5.d, 6.b

U.K. Standards

National Curriculum in England (computing):

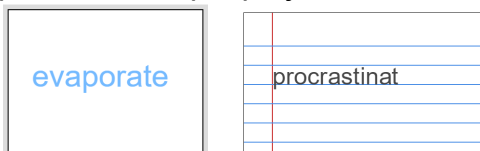
- **Key Stage 3 (Years 7-9)**
 - Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability
 - Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns
- **Key Stage 4 (Years 10+)**
 - Develop their capability, creativity and knowledge in computer science, digital media and information technology
 - Develop and apply their analytic, problem-solving, design, and computational thinking skills
 - Understand how changes in technology affect safety, including new ways to protect their online privacy and identity, and how to report a range of concerns

Getting Started (20 minutes)

Complete this lesson in two different parts:

Part 1:

- Tell students that they're going to use JavaScript and p5.js in an upcoming activity to showcase the story of a word! Inspire your students by playing the provided sample projects. Here's a screenshot image of what they look like:



- Next, ask students to think of a word they like. Do students need inspiration? Refer to the "Help" section of this teacher guide to find GreatSchools.org words that are grouped by grade level
- Once students have chosen their word, ask them to write it on the classroom board. *Optional:* Add 2-3 additional words of your choosing. Students can refer to this list as needed.
- Before students start coding, they need to complete the "Word Magic" assignment (located on the next page) for homework or as an in-class activity.

Name _____
Date _____

Word Magic

Directions: Answer the questions below, then begin brainstorming ideas for how you want to present your project.

Questions:

1. What word are you going to use for your project? Why did you choose to use this word for your project?

2. What is the definition of your chosen word?

3. When you think of your word, what are some visual representations that come to mind? For example, the word "evaporate" could remind you of something light and airy that is slowly drifting off.

4. Write 1-2 facts about your word's history. For example, when did it become a word? What interesting facts did you learn?

5. Some words are made up of different parts that we call 'roots.' Does your word have different parts? What do they mean?

6. Is your word a noun, verb, adjective, or something else?

7. How many syllables does your word have?

8. Use your chosen word in a sentence:

9. Use the back of this paper or the space below to brainstorm ideas for your project.

Part 2:

Once you finish checking your students' worksheet, they're ready to get started on the "Word Magic" DIY module. Remind students that they're going to use JavaScript and p5.js to create their own artistic representation of the word they chose.

DIY Module (30 minutes)

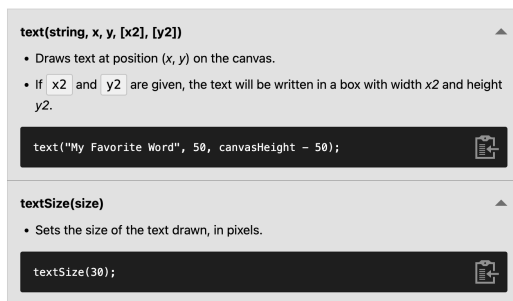
This lesson has one DIY (do-it-yourself) module. Facilitate as students complete the Word Magic module on their own:

Word Magic

- In this DIY, students will create an open-ended, artistic project that showcases a cool word and its story! **Note:** This project is open-ended.
- **Important:** Remind students that they *do not* need to include all the information from their "Word Magic" worksheet into their project. We don't want to restrict their creativity, so how they choose to showcase their word is entirely up to them.
- Do students need extra inspiration? Direct your students' attention to the 2 sample projects located on the tutorial. Here's what it looks like:



- Are students struggling to get started? Direct their attention to the "Useful Functions and Variables" section, which includes code snippets and descriptions. Here's a sample:



- Encourage students to develop their project a little at a time, testing frequently. This will help them figure out where their project is/isn't working as expected.
- Are students still struggling? Start them off with very basic code to help build their confidence. Encourage them to change the parameters (making one change at a time), run their code, then observe how their project changed. Here's an example of code they can start experimenting with:

```
function draw() {
  createCanvas(700, 350);
  background(204, 85, 0);

  textSize(110);
  fill(245, 245, 220);
  text("ENORMOUS", 30,
```

```
200);  
}
```

- Do students want to learn more about p5.js? Ask them to read this helpful, fun blog titled "Explore the Power of p5.js: A Beginner's Guide." Here's the link: <https://www.tynker.com/blog/exploring-the-power-of-p5-js-a-beginners-guide/>
- Did students finish early? Ask them to create another project about a different word. If students are struggling to find a new word, ask them to choose a word from the classroom board, vocabulary terms, or the classroom word wall.

Extended Activities

Show and Tell

- At the end of the time allotted for the Word Magic project, ask students to share their work with a partner and explain how they overcame any bugs or difficulties.
- (Optional) Do a gallery walk as a class, visiting one another's work and asking questions of the artist (the student).

Trivia

- Note that this activity will require advanced preparation.
- Gather 5 of your student's favorite words and their definitions. Next, group students into teams and ask them to try and guess which word goes with the correct definition. Give a hint and ask them to pay attention to prefixes and suffixes. Which team can correctly guess the most words?

Going Beyond Word Magic

If your students enjoyed Word Magic, they're sure to enjoy the rest of what Tynker has to offer! Tynker offers a complete premium solution for schools to teach computer science. Over 400 hours of lessons are available to take K-8 students from block coding to advanced text coding. We offer tons of resources for teachers, including comprehensive guides, free webinars, and a forum to connect with other educators.

More p5.js Activities

In Tynker's Intro to Programming and Art course, students will learn foundational concepts of art and computer science as they're introduced to p5.js! Here's a link to the course:

<https://www.tynker.com/high-school/coding-curriculum/intro-cs-art/1-unit-1-introduction-to-p5-js>



Do More with Tynker

With Tynker, kids don't just acquire programming skills--they explore the world of possibilities that coding opens up. Tynker has several interest-driven learning paths that make coding fun, both inside and outside the classroom:

- **Coding and Game Design:** Your students can use Tynker Workshop, a powerful tool for crafting original programs to make games, stories, animations, and other projects. They can even share their work with other kids in the Tynker Community.
- **Drones and Robotics:** Tynker integrates with connected toys, including Parrot drones and Lego WeDo robotics kits, so kids can see their code come to life.
- **Minecraft:** Tynker integrates with Minecraft so your students can learn coding through a game they love. Tynker offers skin and texture editing, as well as a custom Mod Workshop that lets kids try their original code in Minecraft.
- **Artificial Intelligence** — Webcam projects powered by AI put your students at the center of the action! Students can create interactive Snapchat-style costumes, hand-tracking apps, activity games, and so much more.

Tynker for Schools

Used in over 90,000 schools, our award-winning platform has flexible plans to meet your classroom, school, or district needs. All solutions include:

- Grade-specific courses that teach visual coding, JavaScript, Python, robotics and drones
- A library of NGSS and Common Core compliant STEM courses that are great for project-based learning
- Automatic assessment and mastery charts for whole schools and individual classes and students
- Easy classroom management with Google Classroom and Clever integration
- Professional training, free webinars and other teacher training resources

Need help getting Tynker started at your school? [Contact us](#) to learn more about teaching programming at your school with Tynker!

Help

Need help? Below you'll find answers to frequently asked questions about using Word Magic.

How do I prepare for Word Magic?

Familiarize yourself with the material. After selecting your Tynker lesson (Word Magic), read through the teacher guide and complete the activity before assigning it to students. This will allow you to troubleshoot anything in advance and plan for potential questions from your students.

What is a helpful dictionary my students can use?

- Here's a reliable online dictionary students can use:

<https://www.merriam-webster.com/>

Do you have examples that I can show my students?

Here's a [list of sample words from GreatSchools.org](#) that your students can use as inspiration:

Grade 6 Sample Word List				
Word	Origin	Part of Speech	Sentence	Phonetic Pronunciation
thesis	This word is found in Latin as a borrowing from Ancient Greek.	noun	Nigel wrote his graduate thesis on the change in temperature of the Mediterranean over time.	THEE-sis
unanimous	This word comes from a Latin word.	adjective	The vote to reinstate the book club was unanimous.	yu-NAN-i-mus
declare	This word came through Middle English and French from Latin.	verb	Quinn declared her intent to run for student council president.	di-KLAIR
catastrophe	This word comes from Ancient Greek.	noun	The earthquake was a catastrophe, causing widespread structural and fire damage.	cuh-TASS-tro-fee
unique	This word is borrowed from French.	adjective	Roger was unique in his class for being the only student with red hair.	yu-NEEK
lofty	This word is attested in Middle English and is Germanic in origin.	adjective	Leroy's parents warned him that his dream of becoming famous was a lofty goal.	LOFF-tee
variable	This word came through Middle English and French from Latin.	adjective	The winds are often variable and unpredictable this time of year.	VAIR-ee-uh-bul

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drastic	This word comes from Ancient Greek.	adjective	Turning his frozen computer off and on again was a drastic measure that would lose his work, but Mo had little choice.	DRASS-tik
strategy	This word comes from Ancient Greek.	noun	The basketball team came up with a strategy to counter their opponents.	STRA-te-jee
origin	This word came through Middle English and French from Latin.	noun	Mr. Neng explained the origin of tea to his world history class.	OH-ri-jin

Grade 7 Sample Word List

Word	Origin	Part of Speech	Sentence	Phonetic Pronunciation
bias	This word comes from Middle French, possibly from an Old Occitan word of unclear origin.	noun	Sneha took care to write her report without bias and cite authors from both sides of the debate.	BY-us
ludicrous	This word comes from a Latin word.	adjective	Neveah found her little brother's antics ludicrous.	LOO-di-krus
condor	This word is borrowed from Spanish but originates from Quechua.	noun	Otto lifted his binoculars to better see the adult condor soaring in the distance.	KAHN-dor
bamboozle	This word's origin is unclear but seems to be playful English vernacular.	verb	I fear that I'm easy to bamboozle, because I'm gullible and easily distracted.	bam-BOO-zul
abdicate	This word is a borrowing from Latin.	verb	As news of the scandal circulated the countryside, the duke felt pressure to abdicate his title.	AB-di-kayt
sovereign	This word came through Middle English and French from Latin.	adjective	The people declared their will to be recognized as a sovereign nation.	SAH-vuh-rin
naive	This word is borrowed directly from French.	adjective	I've heard others call Emil naive behind his back because he had a sheltered childhood.	nah-EEV
libel	This word came through Middle English and French from Latin.	noun	Mr. Sakai dismissed the rumors about him as baseless libel.	LY-bel

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dawdle	This word's origin is unknown.	verb	"No time to dawdle," Dave told his sons, "or else we'll be late for dinner!"	DAW-dul
chronological	This word is made of many Greek pieces.	adjective	Tom listed the prior work experience on his resume in chronological order.	kra-nuh-LAH-ji-kul
Grade 8 Sample Word List				
Word	Origin	Part of Speech	Sentence	Phonetic Pronunciation
audacious	This word comes through French from Latin.	adjective	Martina was an audacious skier, daring some of the most difficult slopes.	aw-DAY-shus
boycott	This word was an English surname.	verb	Carl encouraged his friends to boycott the company for its unfair treatment of its workers.	BOY-kaht
novice	This word came through Middle English and French from Latin.	noun	Shanchao was taken on as a novice woodcarver, apprenticed to a master.	NAH-vis
abhor	This word came through Middle English and French from Latin.	verb	My parents abhor many genres of modern music, claiming that classic rock was superior.	uh-BOR
pseudonym	This word comes from a French borrowing of a Greek word.	noun	Jalil wasn't comfortable publishing unless it was credited under a pseudonym.	SOO-do-nim
bizarre	This word comes from a French borrowing of an Italian word.	adjective	My father finds the modern slang that my friends use to be bizarre.	bi-ZAHR
reverberate	This word comes from a Latin word.	verb	Norton watched the strings of the guitar reverberate thanks to a slow-motion camera.	ri-VUR-bur-ayt
apathy	This word came through English and French from Latin, but it is derived from a Greek word.	noun	After completing all of her exams, Lisha felt apathy for the last few days of class.	A-puh-thee
belligerent	This word comes from a Latin word.	adjective	I'd never known Jason to be belligerent, but he got more angry last night than I'd ever seen him before.	bel-LIH-jur-ent

rebuff	This word comes from a French borrowing of an Old Italian word.	verb	Watching Julio rebuff Anita's confession last week was uncomfortable for all parties.	ree-BUFF
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Who is this activity for?

Word Magic is intended for students in grades 6-12 (U.S.) and Years 7-13 (U.K.) with some coding experience.

What will my students learn?

Students will reinforce English concepts, combine creativity, and apply coding concepts to create a fun project called "Word Magic." Additionally, students will expand on their project while experimenting with their code. In this process, students will develop debugging and logical reasoning skills.

Do you have a sample solution?

Yes, but please note that this is an open-ended project where students are encouraged to experiment with their code. Below is the "evaporate" sample project from the Word Magic tutorial:

```

var frameCount;
var loopCount;
var xPos;
var yPos;
var wordSaturation;

function setup() {
  createCanvas(400, 600);
  angleMode(DEGREES);

  frameCount = 0;
  loopCount = 0;
  xPos = width/2;
  yPos = 250;
}

function draw() {
  background(220);

  // Draw frame
  fill(255, 0, 255, 9);
  stroke(0);
  strokeWeight(2);
  rect(10, 10, width - 20, height/2 - 20);

  // Example 9 - Opacity - "evaporate"
  textSize(60);
  noStroke();
  colorMode(HSB);
  fill(210, wordSaturation, 100);
  colorMode(RGB);
  textAlign(CENTER);
  text("evaporate", xPos, yPos);

```

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```
// Draw frame again
fill(255, 255, 255, 0);
stroke(0);
strokeWeight(2);
rect(10, 10, width - 20, height/2 - 20);

frameCount += 1

if (wordSaturation <= 0) {
  loopCount = 0;
  xPos = width/2;
  yPos = 250;
  wordSaturation = 100;
} else {
  loopCount += 1
  wordSaturation = 100-(loopCount*0.5)
  xPos = width/2 + 10*sin(loopCount*3);
  yPos = 250 - loopCount;
}

// Modify the description and timing for your word
if (frameCount > 150) {
  fill(0);
  noStroke();

  textSize(18);
  textAlign(CENTER)
  text("In the scorching heat of the summer, a puddle of water can _____ in
mere moments.", 13, 300, 375, 50);

  textSize(18);
  textAlign(LEFT);
  fill('blue');
  text("DEFINITION", 25, 400);
  fill(0);
  text("Verb: to turn into vapor, OR to disappear", 25, 420, 350, 50);

  fill('blue');
  text("ORIGIN", 25, 490);
  fill(0);
  text("Middle English, from Latin verb \"evaporare\", \"e-\" out of +
\"vapor\" steam, vapor", 25, 510, 350, 50);
}
}
```

Here is the "procrastinate" sample project from the Word Magic tutorial:

```
var loopCount;
var xPos;
var yPos;
var wordSaturation;
var flipFrame;

function setup() {
```

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```
createCanvas(500, 300);
angleMode(DEGREES);

flipFrame = 600;
reflipFrame = 1200;

loopCount = 0;
xPos = width/2
yPos = 250;
}

function draw() {
  background(255);

  // Flash card flip animation (happens much later but needs to be set up here)
  // happens over 10 frames
  if (loopCount > flipFrame && loopCount <= (flipFrame+10)) {
    translate((loopCount-flipFrame)*(width/20), 0);
    scale(1-(loopCount-flipFrame)*0.1, 1);
  } else if (loopCount > (flipFrame+10) && loopCount <= (flipFrame+20)) {
    translate(width/2-(loopCount-(flipFrame+10))*(width/20), 0);
    scale((loopCount-(flipFrame+10))*0.1, 1);
  } else if (loopCount > reflipFrame && loopCount <= (reflipFrame+10)) {
    translate((loopCount-reflipFrame)*(width/20), 0);
    scale(1-(loopCount-reflipFrame)*0.1, 1);
  } else if (loopCount > (reflipFrame+10) && loopCount <= (reflipFrame+20)) {
    translate(width/2-(loopCount-(reflipFrame+10))*(width/20), 0);
    scale((loopCount-(reflipFrame+10))*0.1, 1);
  }
  // else normal scale

  // red line (don't draw on back)
  if (loopCount < flipFrame+10 || loopCount > reflipFrame+10) {
    stroke(200, 40, 40);
    line(60, 0, 60, height);
  }

  // blue lines (different pattern on back)
  stroke(70, 140, 230);

  if (loopCount < flipFrame+10 || loopCount > reflipFrame+10) {
    for (let i=0; i<6; i++) {
      line(0, 70+i*40, width, 70+i*40);
    }
  } else {
    for (let i=0; i<7; i++) {
      line(0, 40+i*40, width, 40+i*40);
    }
  }

  // Draw frame again
  fill(255, 255, 255, 0);
  stroke(0);
  strokeWeight(2);
  rect(0, 0, width, height);

  // Example 3 - Timing - "procrastinate"
```

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```
fill(70);
noStroke();
textSize(50);

loopCount += 1

if (loopCount < (flipFrame+10)) {
  // Word animation
  if (loopCount > 30) {
    text("procr", 60, 150);
  }
  if (loopCount > 150) {
    text("a", 175, 150);
  }
  if (loopCount > 210) {
    text("s", 202, 150);
  }
  if (loopCount > 240) {
    text("t", 227, 150);
  }
  if (loopCount > 250) {
    text("i", 242, 150);
  }
  if (loopCount > 260) {
    text("n", 253, 150);
  }
  if (loopCount > 300) {
    text("a", 281, 150);
  }
  if (loopCount > 360) {
    text("t", 307, 150);
  }
  if (loopCount > 500) {
    text("e", 320, 150);
  }
}

if (loopCount > (flipFrame+10) && loopCount < reflipFrame+10) {
  fill(0);
  noStroke();

  textSize(18);
  text("\nThe students were warned not to with", 10, 35);
  text("learning their vocabulary.\\"", 10, 75);
  textStyle(BOLDITALIC);
  text("procrastinate", 285, 35);
  textStyle(NORMAL);

  fill('red');
  text("DEFINITION", 10, 115);
  fill(0);
  text("Verb: to intentionally put off doing something important", 10, 155);

  fill('red');
  text("ORIGIN", 10, 195);
  fill(0);
  text("Latin \"procrastinatus,\" from \"pro\" forward + \"crastinus\" of",
10, 235);
```



```
    text("tomorrow", 10, 275);  
  }  
  
  // Reset animation  
  if (loopCount > reflipFrame+20) {  
    loopCount = 0;  
  }  
}
```

How can I contact the Tynker support team?

If you have any issues or questions, send us an email at support@tynker.com.