

# Lesson Plan: So Abstract

Original Curriculum

<b>CT Focus: Abstraction</b>
<b>Cross-Curricular Ties: English Language Arts</b>
<b>Age Range: 9–14</b>
<b>Duration: Approx. 30 minutes (more for older students)</b>

## Overview

In this activity, students will assume the role of a newspaper writer being sent out on assignment to cover special assignments for clients. To complete their articles, students will need to use abstraction to keep things simple and within the word count dictated by their editor.

## Vocabulary

*Abstraction:* Getting rid of some of the details in a problem (forever or for just a little while).

### Lesson Objectives

Students will be able to:

- Communicate with classmates to gather details that are important to their articles
- Determine whether information is important to include in their writing
- Demonstrate the concept of abstraction by leaving certain information out of their article
- Create a written piece that fits within the guidelines set by their editor

### Materials and Resources

- Paper
- Pencils
- Whiteboard or projector
- Sample news articles

## Preparation

1. Read the lesson and decide which model works best for your classroom:
  - a. Young students—Children interview one another and put short stories (8–12 words) together in their heads for oral presentation.
  - b. Middle elementary—Students write a short article with three abstractions, then share with the class. The finished piece should be 30–40 words.

## Lesson Plan: So Abstract

- c. Upper elementary or middle school—Students work on two full-length articles that use the same template but demonstrate authentic representations of two different people. These should be 50–60 words each.
2. Assign interviewees to students. It is okay to let students choose whom they are going to interview on the fly, but it can save some chaos to have pairs (or trios) planned in advance.

### Activity

**Step 1. Introduction**—Let your class know that they have all been turned into roving reporters for *Computational Thinking Daily*. Each student will be given an assignment and expected to have it on the editor’s desk by the appropriate deadline (this could be 30 minutes from the start of the activity or several days later, depending on the quality you expect of the finished product).

As editor-in-chief, you will be the reporters’ new boss. You’ve decided to make some changes around here, and you’re going to get this place operating as efficiently as possible. From now on, when reporters write features on other students, all of them must fit the same template and fit into the word count allotted for the daily paper.

Let students know that you have somehow lost the template, but you will show them two finished articles to see if they can help you create a new one.

Share with the class that you need them to use abstraction to find the details that they can ignore when creating the new template copy.

With your class, compare the two appropriate articles for your age group. Have them indicate what needs to be abstracted out by underlining the words. Those underlines will later become blank spaces where they can put their own details after they have completed their interviews.

Have students come up with questions (alone or as a class) that they can ask of their interviewees. Does it make sense to ask questions that we can’t write about? Nope. Knowing which questions are relevant to the article and which questions you should ignore for this interview is another type of abstraction!

**Step 2. Ink slinging**—It’s time for students to have their interviews! Allow students to use the questions they’ve created to find out more about their partner. Encourage older students to take notes to make remembering easier.

## Lesson Plan: So Abstract

After a good amount of time has passed (you will need to judge for your class), ask students to conclude their interviews and head back to their seats to begin writing. If you are working with younger students, you'll likely want to have them stop where they are and stand up to share them immediately.

Have a copy of the blank template on the overhead projector for students to use in the creation of their articles. Allow them an appropriate amount of time to write, and remind them a few times to abstract out details to make sure that they hit their target word count.

**Step 3. Share**—When students are finished, encourage them to share their stories with the interviewees. Give students the chance to stand and read their articles to the rest of the class. Be sure to celebrate successes with applause.

**Step 4. Discuss together**—Ask your class about their experience with abstraction:

- Was it sometimes difficult to figure out what to abstract out when writing your article?
- Were there any ways that abstraction made this assignment easier?
- Can you think of other places that we abstract out information for just a little while (like we did when we made the template)?
  - The "Name:" space on your assignment papers
  - The "Day of the week" space on the board
  - Pretty much anywhere that we save a place for something that changes
- Can you think of other places that we abstract out information for good, just to make things simple?
  - Home address. You don't add "United States" or "Earth."
  - Age. You don't tell people how many days and hours old you are.
  - What you did last night. You don't include things like putting your clothes in the laundry, chewing your food, or going to the bathroom.

**Step 5. In the real world**—In computer science, abstraction is used in a couple of very different ways.

Programmers rarely think about abstracting out details. Usually, they do it naturally by finding a solution that works for one problem, and recognizing that it can also work for other problems if they change a couple of elements. The process of figuring out what those elements are is one form of abstraction. Yes, they ignore the details for a moment, but they understand that those details need to be fed

back into the solution in order to get an answer. This is very similar to where we created blanks to save a place for the interviewee's name and eye color.

Data scientists use abstraction a little differently. Often, when they create a computer model of something like a flock of geese migrating, they determine that some details are just not necessary in creating a visual prediction. For example, they may feel like it's okay to have solid blue dots show the paths of the group of birds, instead of needing to have accurate images with beaks and flapping wings. Technically, this is also abstracting out details, but this time, the scientists have no intention of bringing the details back. This is similar to how we chose to leave some information out of our article, because it didn't fit into the subject of the template.