Family edition

Keyboard Builder: Build to the Order

Ages 12-16 · about 45 minutes, in one sitting

Your child builds keyboards for four customers, each with different needs and a budget, and explains every choice.

What you need

- A computer or Chromebook with a current browser, and a mouse or trackpad.
- The lesson link: mytekdev.com/try/keyboardbuilder?lesson=build-to-the-order&ref=fam-keyboardbuilder-4. No account, no email and nothing to install.

Before you start: try it once yourself

Open mytekdev.com/try/keyboardbuilder?lesson=build-to-the-order&ref=fam-keyboardbuilder-4. A short guide opens over the app. The keyboard on the Build bench is the plain one: 60 percent, light linear switches, a black plastic case, $70.20. The customer's words are on the right, and under them what they say about the board as it is now.

1. **One for the backpack.** Small, no clicking, a clear case, $85. They say "I cannot see inside this case." Click Clear acrylic: $80.20, and the order closes. Tactile switches would feel nice and come to $86.30: "That comes to $86.30. I have $85."
2. **The school store.** A number pad, a key they can feel go in without a click, $125. The board is still the last customer's. Only Full size has the number pad. With light linear switches they say "I cannot feel when the key has gone in." With Tactile they say "That comes to $133.20. I have $125.": the clear case is still on. Put the case back to Plastic: $123.20, and the order closes. It is the only build that does: any extra goes over.
3. **A small desk.** Arrow keys, F keys, 32 cm of room, $105. Tenkeyless has both and they say "That is 36.0 cm wide. I have room for 32." 75 percent is 31.7 cm: $101.20 with the tactile switches still in, or $92.80 with Light linear.
4. **Loud and long lasting.** A click on every key and the keycap plastic that wears longer, $105. On the 75 percent board, Clicky and PBT plastic come to $116.20, over the budget. The customer never asked for a size: 65 percent is $101.40 and 60 percent is $91.30.

> The moment that lands is the school store. The clear case the first customer wanted is still on the board, the price passes $125, and children have to notice that this customer never asked for it.

The ideas, in plain words

The sizes are the real ones. A full-size keyboard has 104 keys. Tenkeyless drops the number pad, 75 percent packs the same keys tighter, 65 percent drops the F keys, and 60 percent drops the arrows as well, down to 61 keys. Nothing is lost for good: on a small board the missing keys move to a second layer. The switches are the three real

kinds. A linear switch is smooth all the way down, a tactile switch has a bump you feel just before the key is sent, and a clicky switch adds a sound to the bump.

The prices are round numbers typical of 2026, not a store's. No brand is named and there is nothing to buy. Where the app repeats what keyboard builders say about sound, about foam or about a metal case, it says "builders say", because nobody has measured it. And the evidence that any switch makes a person type faster is thin, so the app never says one does.

What the lesson practices is older than keyboards: listening to what a person does all day, turning that into requirements and limits, and defending each choice with their words instead of your own taste.

Do it together

1. Open mytekdev.com/try/keyboardbuilder?lesson=build-to-the-order&ref=fam-keyboardbuilder-4 together. A short guide opens over the app. Read what the customer asked for, and what they say about the board.

   > **You'll know it worked when:** They say: I cannot see inside this case.

2. Under `Case`, click `Clear acrylic`.

   > **You'll know it worked when:** The price is $80.20 and the order closes.

3. Take the order `The school store`. Pick `Full size`, then `Tactile`.

   > **You'll know it worked when:** They say: That comes to $133.20. I have $125. The clear case from the last customer is still on.

4. Under `Case`, click `Plastic`.

   > **You'll know it worked when:** The price is $123.20 and the order closes.

5. Take the order `A small desk` and build for it.

   > **You'll know it worked when:** `75 percent` has the arrows and the F keys and is 31.7 cm wide. With the tactile switches still in, it costs $101.20.

6. Take the order `Loud and long lasting` and build for it.

   > **If you get stuck:** If the price is over $105, try a smaller size.
   >
   > **You'll know it worked when:** `Clicky` switches and `PBT plastic` caps. On the 65 percent board that comes to $101.40.

7. Ask: which customer was hardest, and what did you have to give up?

   > **You'll know it worked when:** The school store: only one build fits, so nothing extra could be added.

Talk about it

Ask these while you work together. A child who has understood it can answer them without help:

- Which words in the order told you the size?
- Why not a clicky switch for the school store?
- What did you add that the customer did not ask for, and could they afford it?
- Two people closed the same order with different boards. Can both be right?
- Which board would you want yourself, and which customer is that most like?

> The third question is the real test: a child who took something off because the customer did not ask for it has stopped designing for themselves.

For younger and older kids

Younger: For a younger child, do the first two orders and let them choose the colors for each customer.

Older: For an older teen, ask them to build a keyboard for someone in the family, with a budget, and explain each part in the person's own words.

Keep going

- For A small desk, find the cheapest build that closes the order and the dearest one. What did the extra money buy the customer?
- Open the Switch bench and compare Tactile with Clicky. What is the same about the two lines, and where is the click?
- Write a fifth order for a real person you know: what they do, what they need, and a budget. Trade orders with someone and build theirs.

Bring it into other subjects

- Math: the full-size board has 104 switches at $0.30 each. What do the switches cost, and what share of $123.20 is that?
- Math: a 75 percent board is 31.7 cm wide and a tenkeyless is 36.0 cm. How much desk does the smaller one save, in centimeters and as a percent?
- English: write the order a customer would give for the keyboard you would want, in four sentences, with a budget.
- Art: on the Build bench, choose the three cap colors for one of the customers and say why they suit that person.

For your records

Ready to copy into an hour log, a portfolio or a transcript.

LESSON	Keyboard Builder: Build to the Order
SUBJECTS	Computer science, Technology
TIME	45 minutes
WHAT WE DID	Designed four keyboards in a simulation to meet different users' needs within a budget, and explained the trade-offs in each design.
SKILLS PRACTICED	Designing for a user; Working within a budget; Explaining trade-offs

Activity sheet (optional)

Name: _____ Date: _____

Open the app: scan the QR code, or go to mytekdev.com/try/keyboardbuilder?lesson=build-to-the-order

Essential question: How do you design a device for one particular person instead of for yourself?

Warm-up: Name one thing a person typing at a counter needs from a keyboard that a person carrying one in a backpack does not. _____

1. **Vocabulary.** User, requirement, constraint, trade-off, tactile switch: write each in your own words.

2. **The build sheet.** For each customer (the backpack, the school store, a small desk, loud and long lasting) write: the size, the switch, the case, the keycap plastic, the price, and their budget.

1. Pick one customer. Which words in their order decided the size, and which decided the switch?

2. Name one thing you wanted to add to a board and took off again. What did it cost, and why did it have to go?

Quick check

Name: _____

1. A requirement is (A) something the design must do for its user (B) the dearest part (C) the color of the case

2. The school store customer turned down a clicky switch because (A) it costs more (B) they asked for no click at the counter (C) it has no bump

3. Name one trade-off you made today: what the customer got, and what it cost.

Answers

QUESTION	ANSWER	WHY
1	A	Requirements come from what the user does and asks for, not from what the designer likes.
2	B	The order asked to feel each key go in without a click. A clicky switch has the bump and the click, and costs the same as a tactile one.
3	Any real one	For example: the small desk got arrows and F keys in 31.7 cm by giving up the number pad; or the school store board came in under $125 by going back to the plain plastic case.

If your state or umbrella school asks, this lesson covers CSTA 2017 2-CS-01, CSTA 2026 HS-SYS-HW-30.

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The app this lesson uses is free and runs in the browser, with nothing to install and no account needed. It is at mytekdev.com.

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