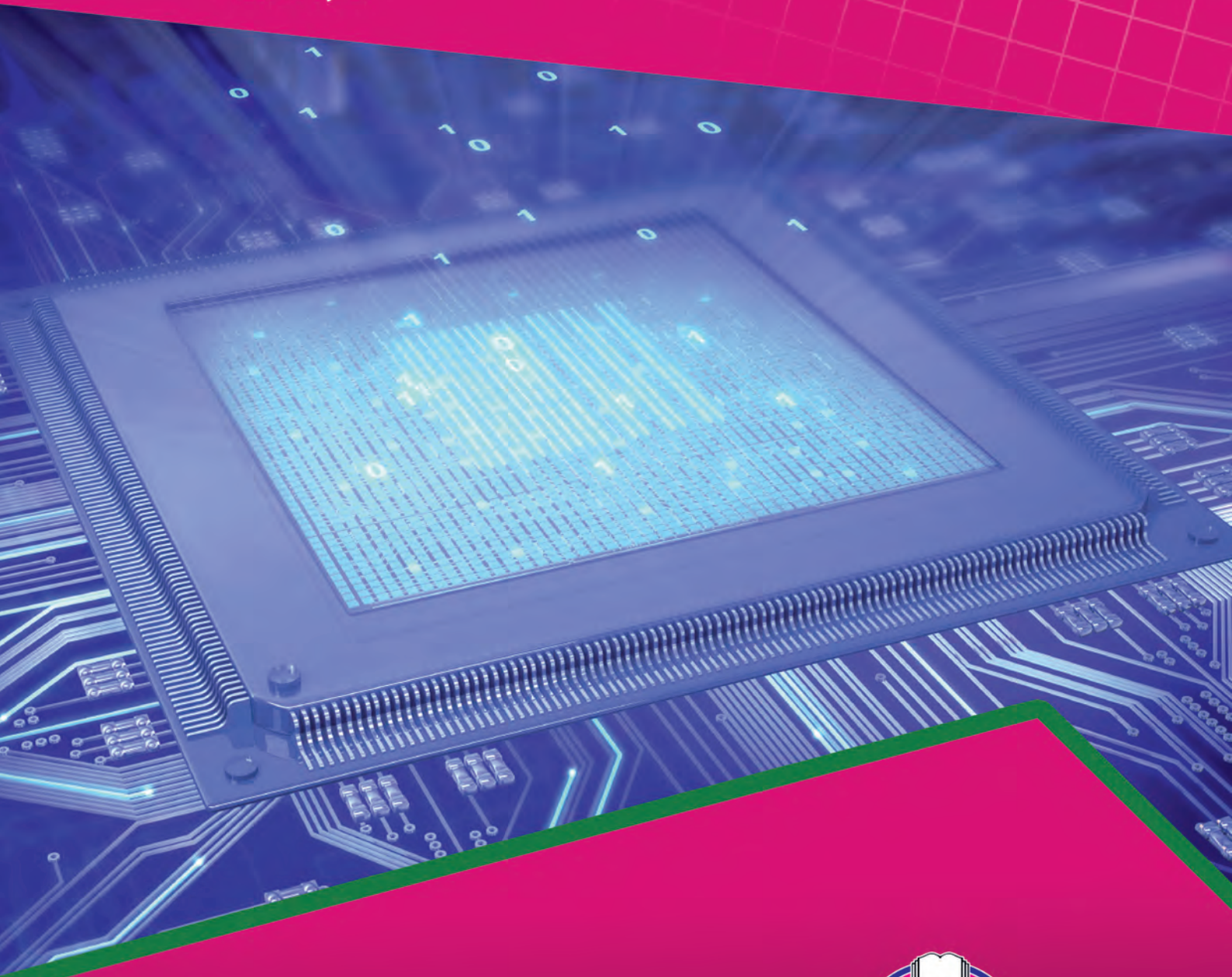


**CAREER
PATHS**

Electronics

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Express Publishing

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4 Replacing components

Removing components

In the past it was simple to remove components. Circuits had one layer. You just had to remove the solder and pull the lead through the hole in the board. Nowadays, boards are **multi-layered**, and component removal requires lots of skill and patience.

molten

clip

chop off

multi-layered

First, **double-check** that you have disconnected the power source. Then, **clear** the solder from the hole using a soldering iron and solder wick. Heat the solder. The **molten** solder will **flow** into the wick. Then you can pull the lead through. For large pieces, **suck** the solder away using a solder sucker. This may leave a **coating** of solder. Remove this using wick.

Some parts of the circuit are made of copper, which absorbs heat. **Thermal absorption** makes it hard to melt solder. The thick, **multi-**

layered boards also produce a **heat-sinking** effect. If you can't melt the solder, don't use a higher wattage iron. This can **deform** the boards and damage the circuit lands. It can also **delaminate** multi-layered circuit board lands and some components' pads. If you can't remove all the solder, **clip** the leads close to the components. Then you can solder the new component to the old component's leads. If you can't reach the leads, **chop off** the component close to its base.

Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are some ways a circuit board can be damaged by heat?
- 2 What are two ways to disconnect leads or wires?

Reading

2 Read the article on removing components. Then, mark the following statements as true (T) or false (F).

- 1 Solder wick is used to remove small pieces of solder.
- 2 A higher wattage iron is good to use on multi-layered boards.
- 3 Remove the solder before cutting the component leads.

Vocabulary

3 Match the words (1-8) with the definitions (A-H).

- | | |
|---------------------------------------|---|
| 1 <input type="checkbox"/> flow | 5 <input type="checkbox"/> suck |
| 2 <input type="checkbox"/> deform | 6 <input type="checkbox"/> double-check |
| 3 <input type="checkbox"/> delaminate | 7 <input type="checkbox"/> clear |
| 4 <input type="checkbox"/> chop off | 8 <input type="checkbox"/> clip |

- A check something twice
B remove obstacles from a passage
C remove the coating
D cut through something small and thin
E remove using a vacuum
F move in liquid form
G change shape in a bad way
H cut and remove something

4 Write a word that is similar in meaning to the underlined part.

- 1 These days most circuit boards are made of several boards on top of each other.
m _ _ _ _ _ a _ _ r _ _
- 2 The fact that some parts take away the heat often makes it hard to melt solder.
_ h _ _ _ _ l _ b _ _ _ _ i _ _
- 3 The thickness of the boards creates a fast cooling effect. h _ _ _ _ _ n _ _ _ g
- 4 You can remove the lead once the solder is hot and in liquid form. _ _ l _ _ n
- 5 You don't need to add a thick layer of paint. A thin layer is enough. _ o _ _ _ n _

5 Listen and read the article again. How do you remove components from a multi-layered board?

Listening

6 Listen to a conversation between two technicians. Mark the following statements as true (T) or false (F).

- 1 The woman is using a solder sucker.
- 2 The man and woman decide to use a higher-wattage iron.
- 3 The man suggests clipping the wires.

7 Listen again and complete the conversation.

Tech 1: Can you help me? I can't remove this 1 _____.

Tech 2: Sure. Removing pieces from 2 _____ is really difficult.

Tech 1: I know. I can't 3 _____.

Tech 2: What are you using?

Tech 1: A soldering iron and wick. But the solder isn't melting, so it won't 4 _____ the wick.

Tech 2: Maybe the iron isn't hot enough.

Tech 1: The iron is hot, but the thermal absorption from the copper parts is producing a 5 _____.

Tech 2: You could try using a higher wattage iron.

Tech 1: No, I don't think we should do that. We could 6 _____.

Speaking

8 With a partner, act out the roles below based on Task 7. Then switch roles.

USE LANGUAGE SUCH AS:

I can't remove this ...

You could try ...

No, I don't think ...

Student A: You are a technician. Talk to Student B about:

- clearing the hole
- the equipment you are using
- other methods of removing the component

Student B: You are a technician. Talk to Student A about how to remove a component.

Writing

9 Use the article on removing components and the conversation from Task 8 to write a memo about the proper way to remove components. Include what type of equipment to use, what equipment shouldn't be used, and when to clip wires.

what equipment shouldn't be used

proper way to remove components

when to clip wires

what type of equipment to use