

# CTE MAKEOVER CHALLENGE

## CTE Makeover Challenge: Bootcamp Lessons

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# CTE MAKEOVER CHALLENGE

## Lesson 0: Orientation and Overview

Kick off your Bootcamp experience by participating in orientation, which offers an overview of the Bootcamp structure, Blueprint requirements, award selection criteria, deadlines, prizes, and next steps. The associated resources and readings will provide context for the Challenge including information on makerspaces and the White House “Nation of Makers” initiative.

### Webinar

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- [Lesson 0: Orientation and Overview presented by Luminary Labs:](#)  
An introductory webinar

Watching the orientation webinar—either live or recorded—is required in order to submit a Blueprint. The webinar will take place at 4pm EDT on April 13, 2016 and the recording will be made available on the [Ed Prizes YouTube Channel](#).

### Resources

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- [Maker Ed’s Resource Library](#).
- [Maker Ed Community](#)
- [Makerspaces.com, “MakerED Resources for School Makerspaces”](#)
- [Maker Media](#)
- [Edutopia, “Maker Education”](#)
- [Digital Promise, “Maker Promise”](#)

### Readings

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- [Artisan’s Asylum, “So You Want a Makerspace?”](#)
- [Young Makers Program, “Maker Club Playbook”](#)
- [National Association of State Directors of Career and Technical Education Consortium, “The National Career Clusters® Framework”](#)
- [WhiteHouse.gov, “A Nation of Makers”](#)
- [Maker Ed, “Makerspaces: Highlights of Select Literature”](#)



# CTE MAKEOVER CHALLENGE

## Lesson 1: Making and 21st Century Skills

With its emphasis on self-reliance, community building, experimentation, and play, the Maker Movement is a natural fit for the ongoing evolution of career and technical education. Discover how making can strengthen skills that will allow students to succeed in the 21st century economy.

### Webinar

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- [Introduction to the Maker Movement presented by Maker Ed](#): overview of making and the origins of the Maker Movement
- [Making in the Classroom presented by Makerspaces.com](#): skills that making builds and how making ties into career readiness

### Readings

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#### ***For Students & Educators***

- [Maker Ed, Makerspace Playbook, Ch. 1, “Beginnings”, Ch. 2, “Places”, Ch. 6 “Practices”](#)
- [TechShop, “The Maker Movement Manifesto”, Sample Chapter](#)
- [Maker Faire Africa, “The Maker Manifesto”](#)

#### ***For Educators***

- [Maker Ed, Open Portfolios, “Survey of Makerspaces, Part II”](#)
- [Connected Learning, “Maker-Ed: Tinkering, Inventing, Learning with Howard Rheingold”](#)
- [Steelcase, “Making Way for Making in Education”](#)

### Assignments

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- **Vision:** After reading [The Maker Manifesto from Maker Faire Africa](#), fast forward to the day you open your new or renovated makerspace. What will the motto of your new or renovated makerspace be?



# CTE MAKEOVER CHALLENGE

## Lesson 2: Learning through Doing

Making encourages students to take learning into their own hands. Explore the topics and skills that can be taught using makerspaces and the projects, tools, and materials needed.

### Webinar

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- [Bringing Your Makerspace to Life Through STEM](#) presented by TIES Teaching Institute for Excellence in STEM: Sample STEM projects and associated skills, machines, and tools
- [Using Crafts-Based Making to Learn Entrepreneurship Skills and More](#) presented by Etsy Manufacturing: The art of designing maker projects to build skills and optimize learning, featuring a case study at Etsy workshop

### Resources

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- [Maker Ed, Maker Ed Resource Library, "Projects & Learning Approaches"](#)
- [Make: Magazine, "Projects" \(includes projects across technology, craft & design, science, and more\)](#)
- [Autodesk, "Project Ignite"](#)

### Readings

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- [Maker Ed, Makerspace Playbook, Ch. 6, "Practices", Ch. 7, "A Year in Making", and Ch. 8, "Projects"](#)
- [The New York Times, "Wood Shop Enters the Age of High-Tech"](#)
- [The Wall Street Journal, "Becoming a 21st Century Digital Tinkerer"](#)

### Assignments

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- **Assignment redesign:** What assignment could be enhanced through a maker project? For inspiration, see [Make: Magazine's project page](#) and [Makerspace Playbook, Ch. 6 "Practices" and Ch. 8 "Projects"](#)
- **Making skills:** What real world skills could you learn through making? How could a makerspace project teach this skill either directly or through the process of making?
- **Users:** What subjects, grade levels, co-curricular organizations, and extra-curricular clubs would benefit from making? Provide an example of how they could use your space.

### Office Hours

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- **Maker Projects in Education**  
*Host: Makerspaces.com*

[CTEMakeoverChallenge.com](http://CTEMakeoverChallenge.com)



# CTE MAKEOVER CHALLENGE

## Lesson 3: Plan It, Make It

Designing your makerspace is the heart of your Blueprint. Draft the design, identify the right tools, and plan how you will construct your makerspace.

### Webinar

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- [Quick Tips on Designing Your Makerspace presented by Maker Ed:](#) Considerations for planning and designing your makerspace
- [CAD Software presented by Autodesk:](#) CAD software for both beginners and more experienced users

### Resources

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- [Autodesk, Education Community Free Software](#)
- [Tinkercad](#)

### Readings

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#### ***For Students & Educators***

- [Maker Ed, Makerspace Playbook, Ch. 2, “Places”, Ch. 4, “Safety”, Ch. 5, “Roles”](#)
- [Maker Ed, Maker Ed Resource Library, “Program & Planning Management”](#)

#### ***For Educators***

- [Educause, Learning Spaces, Ch. 10, “Human-Centered Design Guidelines”](#)
- [Learning Space Toolkit](#)
- [Fast Company, “4 Lessons The Classroom Can Learn From The Design Studio”](#)

### Assignments

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- **Design your makerspace:** Discuss the physical features of your space. Incorporate existing equipment and work areas, consider the flow of traffic, and ways to create a safe environment. Consider how you could make your space accessible for a person with disabilities.
- **Floor plan:** Outline your current space in computer-aided design (CAD) software to determine your constraints. Where are the doors, windows, and outlets?
- **Build plan:** How will you build out your makerspace? Map out your timeline and identify who will be involved in putting together key elements.



# CTE MAKEOVER CHALLENGE

## Lesson 3: Plan It, Make It

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### Office Hours

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- **AutoCAD Software**  
*Host: Autodesk*
- **Tools, Equipment, and Makerspace Safety**  
*Hosts: Snap-on Incorporated, U.S. Fab Lab Network, and National Coalition of Certification Centers (NC3)*



# CTE MAKEOVER CHALLENGE

## Lesson 4: Identifying and Engaging Your Community

Collaboration, inclusivity, and community building are core components of the Maker Movement. Explore ways to engage students, parents, educators, librarians, and members of the local business and tech communities. Consider how your community can contribute to building and sustaining your makerspace.

### Webinar

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- [Identifying and Engaging Your Community presented by University of Michigan](#): Bringing together students, educators, businesses, and local organizations

### Resources

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- [Maker Faire, “Maker Faires Around the World”](#)

### Readings

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- [Info Today, “Making and Community Engagement in the Library”](#)
- [DeLaMare Science & Engineering Library, “Community Engagement and Makerspace”](#)
- [Maker Ed, Youth Makerspace Playbook, “Sustainability”, p. 52](#)

### Assignments

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- **Make a list:** Identify community stakeholders who you can involve in your makerspace.
- **Attend a local event:** Find a local Maker Faire, PTA event, or other school meeting and grow the network that will help bring your makerspace to life.

### Office Hours

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- **Connecting with the Community**  
*Host: Maker Ed*



# CTE MAKEOVER CHALLENGE

## Lesson 5: Budgeting and Resources

Make your plans a reality by drafting a budget and coming up with ways to gather the resources you will need to build a sustainable makerspace. Think about innovative ways you can use existing and low-cost resources to execute your vision.

### Webinar

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- [Crowdfunding Through Online Platforms](#) presented by [DonorsChoose.org](#): Tips to secure resources, including how to create an effective online fundraising campaign
- [Budgeting for Your Makerspace](#) presented by [University of Michigan](#): Cost considerations for building and maintaining your makerspace

### Resources

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- [DonorsChoose.org](#)
- [PledgeCents](#)
- [Kickstarter](#)

### Readings

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#### ***For Students & Educators***

- [Maker Ed, Makerspace Playbook, Ch. 3, p.11, “Tools & Materials”, Ch. 9, p.43, “Startups”, and p.61, “Sample Proposal and Budget to Submit to a Funder”](#)
- [PledgeCents, “Steps to Success”](#)

### Readings

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#### ***For Educators***

- [Makerspace.com, “High School Makerspace Tools & Materials”](#)
- [NYSCI, “NYSCI Maker Blueprint”, “How will the Maker Program be Funded and Sustained?”, p.13 and “Budget”, p.14](#)
- [MakerBot, Strategies for Funding a MakerBot Innovation Center at Your University](#)



# CTE MAKEOVER CHALLENGE

## Lesson 5: Budgeting and Resources

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### Assignments

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- **Budget:** Draft a budget for your makerspace. Where will you source your equipment and materials? What are your “must have” items and your “nice to haves”? Consider both one-time and recurring expenses.
- **Funding:** How do you plan to fund the space? Consider the funding sources described in this lesson.

### Office Hours

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- **Creating a Budget**  
*Host: Maker Ed*

