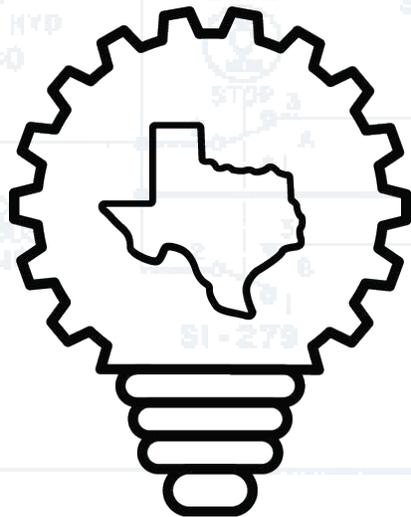


STEM Club Series
DESIGN WORKBOOK



Texas Alliance for Minorities in Engineering

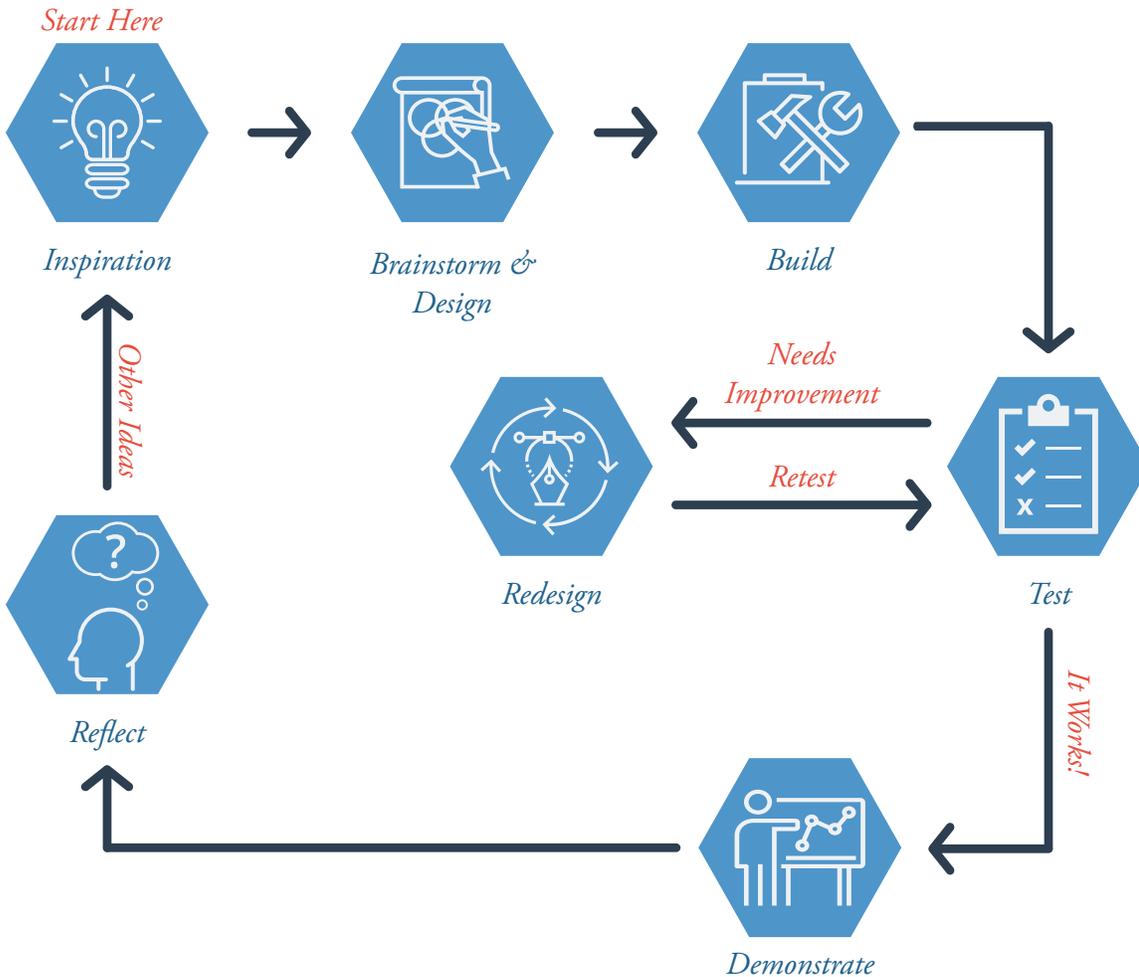


ENGINEERING DESIGN PROCESS

Welcome, engineers!

Use this workbook to record your design process. What problem are you trying to solve? What are some ideas you want to try out? What works and what doesn't? What could make your design even better?

ENGINEERING DESIGN PROCESS



STEP 1: Identify the problem. What problem are you trying to solve?

STEP 2: Brainstorm. Talk about, write down, and/or draw as many different ideas as you can.

STEP 3: Design your first solution. Pick your favorite idea from **STEP 2** and decide how you're going to build it.

STEP 4: Build your design.

STEP 5: Test it out. What works? What doesn't?

STEP 6: Refine your design. How can it be made even better?

STEP 7: Share your solution with others!

STEP 8: Reflect on your process and your design. What was your favorite part? What was the hardest part? What do you want to try next?

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STEP 8: Reflect on your process and your design.

What was your favorite part? What was the hardest part? Are there tools that would have made this easier? What will you do differently next time? What do you want to try next?



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GRAND CHALLENGES

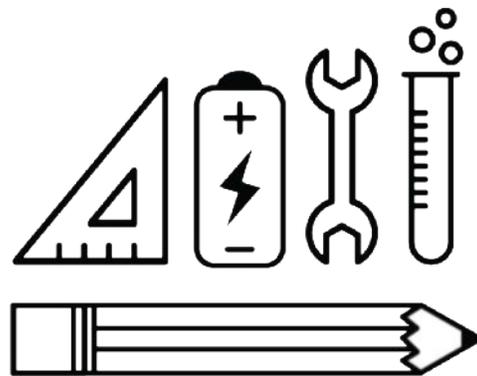
If you could do one thing to make life on Earth better, what would that thing be? According to some of the world's smartest people, these are challenges that humans will face in the next 100 years. How can you help solve them?

- **CAN YOU HELP ENGINEER THE TOOLS OF SCIENTIFIC DISCOVERY?** Explore the deepest depths of the Earth's oceans? Today's students will help invent and improve vehicles and tools for exploration of the farthest reaches of the earth, and even the universe.
- The sun is an excellent source of power, but so far, solar energy is only providing 1% of the world's energy. **CAN YOU IMPROVE SOLAR TECHNOLOGY** to help capture and use more of the sun's energy?
- **HOW CAN YOU HELP MAKE BETTER MEDICINE?** The more we understand about how diseases work, the better we can create medicines and procedures to cure these diseases—and maybe even develop ways to prevent the diseases in the first place.
- Water has lots of good uses, but only if it's clean. Some places don't have enough and others have too much. If you live near the ocean, for example, you have plenty of water, but ocean water is too salty to drink. Some water makes people sick with pollutants. **CAN YOU HELP THINK OF WAYS TO PROVIDE ACCESS TO CLEAN WATER FOR ALL PEOPLE?**
- We learn from the universe around us, and we have to reach the far ends of the earth and our solar system to gather that data. Today's students will take part in the great quest for understanding many unanswered questions of nature. **HOW CAN WE EXPLORE NEW PLANETS?** What new types of aircraft and spacecraft can you design?



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CONTACT TAME



O: (512) 471-6100
F: (512) 471-6797



PROGRAMS@TAME.org



www.TAME.org



TEXAS ALLIANCE FOR MINORITIES IN ENGINEERING (TAME)

10100 Burnet Road, R9200 | Austin TX 78758

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