



# STEAM TO BUILD DREAMS PROJECT

AN INITIATIVE OF THE MASSACHUSETTS COALITION FOR THE HOMELESS



# USING STEAM TO SOLVE A REAL-LIFE SOCIAL ISSUE:



What's more empowering for students than helping to create solutions to real-life issues? When students learn about local issues and then engage in working towards shaping solutions, they become independent thinkers and change makers - that is why A Bed for Every Child created the STEAM to Build DREAMS Project.

In Massachusetts, 1 in 8 children are growing up in poverty. Although a bed is probably not the first thing that pops into your mind when thinking of childhood poverty, thousands of children across Massachusetts do not have one of their own, simply because it is financially out of reach for their parents. Healthy sleep is important to a child's health and development and plays a vital role in preparing them to succeed academically and socioemotionally. But it all begins with having a bed!



Seven years ago, A Bed for Every Child was created when a public-school teacher approached us with one simple request - she wanted beds for her students who did not have one of their own. What she was seeing is what teachers across Massachusetts are seeing every day - students tired and unfocused because they are not getting the consistent sleep they need because they do not have a bed. Most are sharing a bed with a sibling or sleeping on the floor, couch or air mattress. That one simple request has now turned into a statewide effort to supply beds to children growing up in poverty without a bed of their own. Since its inception, A Bed for Every Child has delivered over 6,000 beds with 2,229 beds delivered last year alone.



“PROVIDING STUDENTS WITH REAL-WORLD PROBLEMS AND ASKING THEM TO BRAINSTORM SOLUTIONS WILL BRING THEIR HIGHER ORDER THINKING SKILLS INTO PLAY.”

**Anne Jolly, Scientist and Alabama Teacher of the Year.**

A Bed for Every Child created the STEAM to Build DREAMS project with a goal to partner with school districts in communities with significant numbers of their students growing up in an economically disadvantaged household. Often, these school districts have limited funds and their students miss out on enrichment projects such as STEAM to Build DREAMS. For the past 12 months, the STEAM to Build DREAMS project has been partnering with middle schools within these districts to engage their students in designing, measuring, building and painting twin sized bedframes to be delivered to children on A Bed for Every Child's waiting list.

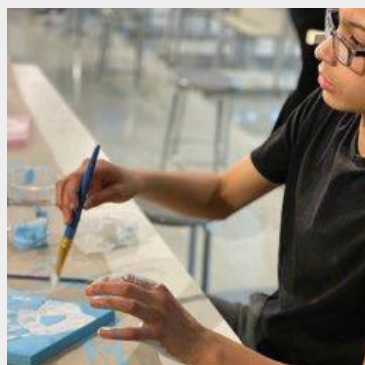
STEAM projects require students to systematically think through problems, applying the information they learn along the way to figure out the best solution. The STEAM to Build DREAMS Project gives students a chance to engage in a hands-on, experiential learning environment where they will learn new skills, apply mathematics and measuring and think creatively while engaging in the design process.

The STEAM to Build DREAMS project provides a meaningful, team-building experience as students learn to work together, ask questions, divide up responsibilities, compromise, listen and encourage each other. At the end of the 3-part series, their designing, measuring and building will result in a one of a kind twin bedframe designed specifically for a child growing up in poverty in need of a bed of their own.

The STEAM to Build DREAMS project offers an interdisciplinary learning experience that uses teamwork, logic, \*soft skills, technical skills, design, math, critical thinking, visual and hands-on creativity.



## COMBINING MATH, CRITICAL THINKING, CREATIVITY AND HANDS-ON BUILDING:



Educators know that a great STEAM project brings the outside world into the classroom and challenges students to think critically and the STEAM to Build DREAMS Project does just that. The project brings this “real-life social problem” into the classroom for students to work together to design, measure, build and create a one-of-a-kind twin bed for a child on A Bed for Every Child's waiting list.

The STEAM to Build DREAMS Project is three, two-hour sessions on-site at the school. STEAM to Build DREAMS has two bilingual instructors at each session to work with the students. Everything needed to design and build the beds is brought to the school and provided to the students.



## CURRICULUM:

### Session 1:

**Supplies Brought to Session 1:** Rolls of large drawing paper which are taped to each team's drafting table, protractors, 40" rulers, pencils and erasers are provided to each team along with a block of wood to understand density.

### **Educating About a "Real-Life Problem:"**

**Instructor 1:** Talks about A Bed for Every Child and the work it is trying to accomplish throughout the Commonwealth in supplying beds to children without one of their own. Teams are given statistics on the ages of the children, geographic areas it is serving and the current sleeping arrangements of the children (i.e., sleeping with a sibling or parent, sleeping on the couch or sleeping on the floor) on the waiting list. Through this data, students understand the social need they will be addressing.

**Instructor 1:** Talks to the students about how their efforts in The STEAM to Build DREAMS Project will have an impact on a child's life. They will learn that not having a good night's sleep can result in poor cognitive and academic functioning for a child and how the provision of a bed will ensure the child will have a comfortable and safe place to sleep.

**Team Building:** Teams of 4 to 5 students are formed.

**Instructor 2:** Gives each team a red envelope that contains information on the child they will be designing a bed for. They will receive the child's first name, age, city they live in and what their current sleeping arrangement is.

### **Research:**

**Instructor 2:** Instructs students to research on their phones, or on a laptop computer, the specs of a finished twin bed frame, including the height, length and width. This will give them the parameters to which they can design their headboard.



### **Design, Math and Creativity:**



Both Instructors show examples on how wood can be cut into different shapes as well as the different materials that can be used to enhance designs. Teams are given a piece of wood to show the thickness and to understand how it can be cut. Students are then given the opportunity to get creative and design a one-of-a-kind headboard for the child in their envelope. This is when the teams come alive and discussions begin on what type of design the child would like.

Teams begin drafting, in detail, their design on the large paper using their measurements and design ideas. This will be used as the pattern for instructors to cut the wood to the student's specification back at the workshop which is off site.

Students also create the color pallet with detailed specifications on paint colors and materials to be used and where on their headboard design.



### **Closing Remarks of Session 1:**

**Instructor 1:** Discusses the next steps that will occur during the two-week break between sessions and will show the students the type of jigsaw that will be used to cut their design. Paint and materials for their design will be purchased.

**Instructor 1 and 2:** Talk about what will happen during Session 2. They will let the students know that their headboard and design pieces will be brought back so during session 2 they will be able to build the headboard, put their design together and paint. Instructors ask each team to present one challenge they had during Session 1 and how they overcame it.

### **Work Done Outside of Session 1:**

At the end of the first 2-hour session, drafting supplies are gathered and paper is rolled up. They are then brought back to the workshop. Over the next two weeks designs will be cut from wood by STEAM to Build DREAMS staff using the patterns drafted by the students. Paint colors and additional materials will be purchased to students' specifications. On average, work outside of the session can average 5 hours per design.



### **Session 2: Logic, Soft Skills and Technical Skills combined with Left Brain = Creativity**

The cut wood for each team's design is bundled up and loaded onto the truck, along with paint, design items, tools and supplies needed to assemble the headboard.



STEAM to Build DREAMS Instructors are on site at the school a half hour in advance of the session to set up workstations for each team. At each workstation, all the team's materials are placed along with their original pattern. Paint brushes requested paint colors and design materials are also placed. Students join their team partners to begin Session 2.

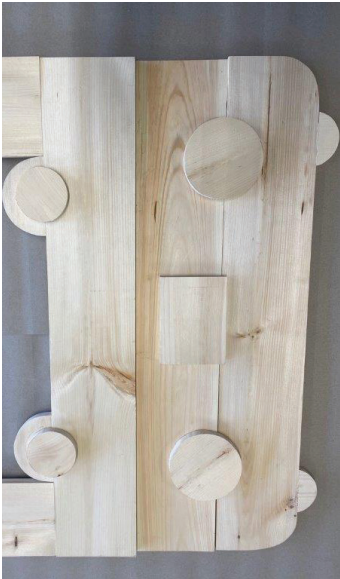
**Instructor 1:** The teams are presented with their materials cut to their specifications. Students are shown how to safely use and handle the power drills. The students will use technical skills to assemble their design for the headboard. They work together to assemble and paint their design on the finished surface of the headboard.

Instructors 1 and 2: Assist teams with any challenges they encounter. At the end of the 2 hours, each team has completed their headboard.

**Closing Remarks:**

Instructors 1 and 2 let students know what the next steps are off site at the workshop and back on site to complete their beds at Session 3. They inform the students that they will be cutting wood for the side rails and foot board as well as painting these pieces to the team's color specification. They then let the teams know that during Session 3 they will build the footboard and then assemble the twin bed. They ask each team to present one challenge they had and how they overcame it. Teams assist in bring their completed headboard back to the truck along with all the toolboxes.





The Instructor again offers safety tips to using the power drills. Teams discuss the directions and begin to assemble their bed. Within one hour the teams are seeing the fruits of their labor as their one-of-a-kind twin bed comes together.

It is at this time that we witness team members giving each other high-fives on the completion of the beds. We also see their cell phones come out to take a selfie with their bed. It is not uncommon to overhear students saying they can't believe they designed and built an actual bed.

### **Closing Remarks of Session 3 = Impact**

**Instructors 1 and 2:** Lead the teams in a discussion on how it felt to build a bed for a child on A Bed for Every Child's waiting list. Each team shares with the other teams how they came up with the idea for the headboard, how it felt to see their design come together and what new skills they learned and now have. The Instructors ask each team member to sign the back of the headboard and think about an inspirational message for the child that soon will be sleeping in their one-of-a-kind bed. Teams line up the beds for a group photo.

Before the students leave, Instructors ask students to participate in giving feedback on the project. Surveys are passed out for students to participate in anonymously which allows us to know what's really working and what isn't, what new skills the students have acquired and how they feel they can use these skills in the future. We also ask them how they feel about solving a real-life social issue and what the project could do better.

We may think we know, but student insight really helps us to see what the learning experience is like and it helps us to keep their needs and personal understanding in mind. The surveys have also been crucial in making the STEAM to Build DREAMS project accessible for all students including ESL students, students with learning differences, and those with special needs. Getting their feedback has allowed the project to implement changes and improvements to offer an equal experience for all who participate.

At the completion of sessions, we set a time to meet with our participating school to discuss their student engagement, review that we met the measurable learning objectives and larger programmatic goals that were set prior to the series. We also share the feedback that we received from the students' anonymous survey. Their feedback has and will continue to allow us to improve and expand the STEAM to Build DREAMS project.





## GOALS & OBJECTIVES

STEAM to Build DREAMS Project goal is to partner with school districts within low income communities to engage their students in a STEAM project. Through this partnership the project will offer students a unique opportunity to give back to a child in need, while incorporating design, math, critical thinking, visual and hands-on creativity. Students at the end of the 3 sessions will have gained new skills as well as learning that they all can become, "Master Bed Builders."

### Goals and Outcomes for each STEAM to Build DREAMS Project.

**Goal:** To partner with school districts within low-income communities.

**Outcome:** Each STEAM to Build DREAMS Project will partner with a middle school take place and a minimum of 30 students will have an opportunity to participate in creating and building 10 bed frames.

**Goal:** To engage students in a STEAM project that will solve a real-life social problem while encouraging critical thinking, hands-on building and creativity to solve the problem.

**Outcome:** Inform 30 students about the number of children in MA without a bed and provide them with the opportunity to learn new skills, create something impactful and build 10 bed frames for delivery.

**Goal:** To have students incorporate design, math and creativity to create a pattern for a twin-size headboard.

**Outcome:** 30 students will work together in teams of 4 to 5 students over the first session of the STEAM project to draw out a detailed pattern using real life measurements that will then be used to cut the materials to make the bed. Their drafted pattern will be brought to life as they put it together as a team.

**Goal:** To have students use logic, soft skills and technical skills to build the twin bed frame they designed.

**Outcome:** 30 students will work together over 2 hours to build the twin bed frames during the second session.

**Goal:** To have students work together to sand, paint and add the creative finishing touches that make the team's bed one-of-a-kind.

**Outcome:** 30 students will have engaged their left brain to get creative and make 10 beds during the third session of the project which will then be delivered to 10 children.

**Goal:** To receive student feedback to help us implement any needed changes to the project.

**Outcome:** 30 students that participated in the STEAM to Build DREAMS Project will fill out an anonymous survey which our staff will review.







## OUR REQUEST:

STEAM to Build DREAMS is requesting a grant to support a partnership with the Lynn Public Schools and Project YES (Youth, Empowerment, Success). Project Yes is an after-school program for students at the Thurgood Marshall Middle School. Project YES's mission is to help students develop the skills needed to become strong leaders in their school and community. Annually, they have over 60 students participate in the program. Students are chosen by faculty to participate in the program because they are growing up in a family that has a member previously or currently involved in gang activities, struggling with an addiction or incarcerated putting them at high risk. The demographics of the students that participate are 92% English as a second language, 95% are growing up in a home that is economically disadvantaged, 73% Hispanic, 10% Black, 8% White, 6% Asian and 3% are Multi-Race. Student are in grades, 6th, 7th and 8th putting them between the ages of 12 and 14 years old.



Project YES has limited funding though a budget from Thurgood Marshall Middle School. Our goal is to conduct 3 STEAM to Build DREAMS Projects with YES students over the course of the school year. With your support, 30 Project YES students will be able to take part in the first of 3 STEAM to Build Dreams projects. We will use your support to leverage additional funds to ensure 30 additional YES students can participate in the second project of 3 that will take part in the second half of the academic year 2020/2021.