

# Teenage Boy Builds His Own Lego Arm

## - Creativity, Perseverance and Hope in Action

*This lesson can be presented over 1-2 sessions. Instructors should feel free to use whichever discussion questions and activities you think best for your class or group. We advise giving students the sheet with the definitions of the virtues before each session.*

### Lesson Goals

Help students:

- appreciate the value of being creative in coming up with new ways to work toward goals and to solve problems, especially in the context of using resources that may already be available to us
- realize the power of perseverance, determination and hope in overcoming obstacles
- appreciate the potential of science to improve our lives, and motivate students to consider pursuing further education and jobs in the sciences
- become more aware of the challenges individuals face who are born with or develop physical disabilities, and to consider whether their school and community provide enough access and offer opportunities to those with disabilities

### Primary Virtues / Character Traits

**Creativity:** to create new ideas; to come up with new approaches and methods for accomplishing a goal or solving a problem

**Determination:** firmness of purpose; complete commitment to achieving a goal

**Hope:** confident expectation of achieving a goal or wish

**Perseverance:** trying hard and continuously in spite of obstacles and difficulties

### Secondary Virtues / Character Traits

**Caring:** to help others; a caring person lives with empathy in trying to understand another person's situation, compassion in desiring to help others, and generosity in acting to help

**Resilience:** the ability to recover from, or successfully adjust to change and difficulties

### Leader Introduction

David Aguilar is a 19 year old teenager from a small country in Europe named Andorra that is in between Spain and France. David was born without a forearm and says that, "As a child I was very nervous to be in front of other guys, because I was different, but that didn't stop me (from) believing in my dreams."<sup>1</sup> David's dream is to design affordable robotic limbs for people who need them. Let's see how David is coming along.

<sup>1</sup> <https://www.reuters.com/article/us-spain-lego-prosthetic-arm/brick-by-lego-brick-teen-builds-his-own-prosthetic-arm-idUSKCN1PW155>

### Film Clip

<https://www.youtube.com/watch?v=vFymKqUwodY>

## Leader Summary

It's amazing to see what David has already accomplished with Legos. If David continues with his education in bioengineering, and especially continues to live with perseverance, determination and hope he will likely achieve his goal and someday will be designing affordable robotic limbs for others who need them. David's story may also inspire some of us to consider how we could improve the lives of others through the study of science and working in that field.

## Discussion Question Options *(discussion prompts / answers are in parentheses if needed)*

Before beginning our discussion, let's read over the virtues and their definitions - included within the online lesson as a separate document.

1. David is an inspiring example of how we can be resilient in successfully adjusting to obstacles and difficulties in our lives. What are some of the virtues that David is living out that have enabled him to become resilient? For each virtue we mention let's discuss how he is living it out.

(Creativity – David thinks “outside of the box” using something as simple as Legos to build his own arm that actually works and performs many of the functions that a “normal” arm would.

Perseverance – his first attempt was at 9 years old but Legos weren't strong enough then. Once the Lego blocks became stronger he started again and worked on several different models until finally succeeding with his latest model.

Hope – David said that although he knew he was different that wouldn't stop him from believing in his dreams.)

2. David was born with a special and significant challenge in being born without a forearm, but he was also born with certain advantages such as a supportive family, and having access to the more advanced Lego robotics kits. We are all likely in a situation where our life has both special challenges and advantages.

Do you think that even if we don't have David's specific advantages we can still be resilient in our lives in adjusting to obstacles by living with perseverance and determination to pursue our own goals? Let's talk about how specifically we can do this? (focusing on our education; asking for help and developing a relationship with an adult who can be a good role model such as a teacher, coach, or someone else within our community; encourage students to discuss what resources are available within their community)

How can we be there for each other in helping each other to overcome, or adjust to problems or obstacles? (simply spending time with others and being a good listener when you know someone is having a hard time; offering helpful advice if the other person is open to it; affirming the good qualities of another person; encouraging a friend to seek out help from a good adult such as a teacher, coach and hopefully a family member; talking about our dreams and how we can achieve them)

3. David's story highlights the power of science in improving our lives through better health care. What are other areas of our lives and / or problems that science can help us to improve upon and to address?

(Garbage – science may help us to find ways to make more products of value from what we throw away and this would improve our environment.

Transportation – building cars, buses, trains and trucks that use electricity or other fuels that would be cleaner than gasoline and yet still effective and affordable.

Clean Water & Sanitation – over 660 million people in the world lack access to clean drinking water and 2.4 billion people lack access to basic bathrooms resulting in many unnecessary deaths each year. Science is developing more effective and affordable solutions for these problems. <https://www.cdc.gov/healthywater/global/assessing.html>

This is also a team presentation project outlined below)

What are some jobs in the field of science that we can consider pursuing? (engineering in many different fields such as electrical, mechanical, aeronautical, structural, civic and bioengineering like David in our story; scientific research to develop new or more advanced understanding of our world; forensics in using science to detect and solve for crimes; health care in research, being a doctor, nurse, pharmacist, operating medical imaging equipment and administering medical tests)

4. It's incredible that science has already brought us to a place where a teenage boy can make a functioning artificial arm out of a Lego robotics kit. Let's talk about what you think will be the most exciting or interesting change that science will bring to our lives in the futures. (This is also a journal writing option below)

5. What problem in our school, local, national or global community do you see where you think a new and creative approach can make a difference? (This is also a team activity below.) (With each problem presented, encourage students to discuss new approaches for addressing them and whether these proposed approaches would be effective and sustainable.)

### **Journal Writing Options**

1. Write out what you think will be the most exciting or interesting change that science will bring to our lives in the futures.

2. Write about an experience where you, or someone else you know, experienced a problem and by approaching the problem in a new and creative way the problem was lessened or solved.

### **Extended Activities:**

1. Ask students to assess their own school and other community facilities and discuss how they are and / or are not accessible for people with disabilities. For any facilities that are not accessible, encourage students to discuss what can be done to improve accessibility.

2. Organize your group into teams and ask each team to choose a problem or challenge that scientists are already working on. Each team should outline the problem or need, what solutions scientists are already working on, and highlight a solution that your team thinks could be most effective. Some areas to address are: garbage, transportation, clean water and sanitation, affordable housing, space travel).

2. Organize your group into teams and ask team to choose a problem in our school, local, national or global community where through a new and creative approach we can make a difference. Ask each team to then make a presentation to the group as a whole on the problem, the causes of the problem, the team's proposed new approaches to addressing the problem and expected outcomes. Each team member should speak.

Following all of the team presentations, ask the class to vote on the team that has the best proposed solution. Voters should consider the effectiveness of the proposed solutions and whether it is sustainable.

# Character Action Media

*Connecting Virtues to Our World*

[www.characteractionmedia.com](http://www.characteractionmedia.com)

Current Links in Education

Copyright 2016