

**FIRST Robotics Competition  
2010 Award for Excellence in Design  
Sponsored by Autodesk**

Autodesk has been a proud sponsor of the *FIRST* Robotics Competition (FRC) for over 18 years. Like you, we understand how participating in FRC positively impacts the lives not only of young people, but also of the mentors, educators and leaders from business, industry, technology, and government that support the program. We continue to believe that every FRC participant should understand and value design as a process, and consider design technology as tools which will provide your team a competitive advantage. This year, Autodesk sponsors the FRC 2010 Excellence in Design Award to honor clear and compelling evidence of excellence in design development, documentation, communication, and presentation. The intention of the Award is to inspire, recognize and celebrate design as one way in which you can change your world.

**For the complete, detailed and official rules for the 2010 Award for Excellence in Design Sponsored by Autodesk, go to: [www.autodesk.com/first](http://www.autodesk.com/first).**

#### ***Award Overview***

With a distinctive history of 18+ years of sponsorship of *FIRST* Autodesk wants to honor the inventors, engineers, and design and animation professionals of the future who are at the center of the *FIRST* Robotics Competition. We want to help you develop an awareness of the power of design; learn the processes and tools for great design; and award your achievement in design excellence. We understand that you want to have a positive impact on the world, and now more than ever, design technology is helping to improve the way we live and shape the world in which we live.

#### ***Award Criteria***

The 2010 Award for Excellence in Design, Sponsored by Autodesk has two separate and distinct categories:

Category One: 3D Design

Category Two: Animation

The description of each Award Category and the Award criteria for each Award Category, including requirements for content and submittal are detailed below. Also detailed below are the criteria and process for judging and recognition of winners in each Award Category.

The Championship winner for each Award category will receive: A scholarship for one mentor and one student from the winning team to attend Autodesk University 2010, Autodesk product and logo merchandise, and a web banner to place on their website.

**Note: Autodesk will post a FAQ, “Tips”, a virtual workshop on Design as a Competitive Advantage, and blogs from Phil Dollan and Ted Boardman on the Autodesk Education Community ([www.autodesk.com/first](http://www.autodesk.com/first)) to support teams competing for this Award.**

## **2010 Award for Excellence in Design, Sponsored by Autodesk**

### **Category One: 3D Design**

**Note:** This Award will be judged and presented *only at the Championship level* in 2010.

#### Purpose of the Award:

This Award Category honors excellence in demonstrated understanding of the design process, knowledge of mechanical engineering and design principles, mastery of 3D design technologies – including CAD and digital prototyping, and presentation.

#### Award Description:

The Award recognizes outstanding achievement in design of the team robot using Autodesk Inventor Professional software. The software gives teams the power to conceptualize, visualize, digitally prototype, and analyze in a virtual environment so design and performance considerations can be addressed & optimized prior to actually building the robot – saving valuable time and resources exploring alternatives.

#### Here is Your 3D Design Challenge:

You have the opportunity to demonstrate how intentional you are about designing a robot that you think will compete successfully in the FRC 2010 season. There is always that temptation to dive into the FRC kit of parts and start bending or cutting metal...jumping right into build without taking the time to explore design alternatives or digitally prototype possibilities. Time is precious, but the time you take to follow a designerly process from the get-go will save the time you may otherwise spend on reworking that robot you built too quickly. You can use Autodesk Inventor Professional 2010, as well as other Autodesk software – such as AutoCAD or Autodesk SketchBook Pro – to brainstorm or rough out ideas and share them with your team on Autodesk’s Education Community. You can move into 3D design and modeling, using the 2010 virtual kit of parts modeled in Autodesk Inventor and available to you January 9, 2010 at [www.autodesk.com/first](http://www.autodesk.com/first). To compete successfully for this Award you develop a succinct statement of the design problem you’re trying to solve. We know the 2010 FRC game, so it will be important for you to let us know the particular features or functions you want your robot to take into competition. Show us how things progress from rough sketch through work flow to an Inventor image and photograph of your ready-to-rumble competitive robot. The winner of this Award will be the team that clearly demonstrates excellence both in using the design process and in tapping the power of Autodesk technology to make design a competitive advantage!

#### Award Requirements – Content & Format:

Required Content and Format: There are two separate but related required areas of content, and there are required formats for each area of content.

## One: Evidence of Design Intent & Execution

Files that will need to be included in this area of your Entry submission are as follows:

1. A brief (50 word, maximum) statement of the design problem you set out to solve
2. A sketch (pencil or technology) that illustrates concepts you explored and progress you made designing your robot. **Note:** This can be excerpts from a design notebook, white board notes and drawings, your design process with documented milestones, or even pencil sketches or thumbnails – any of these scanned and submitted in .pdf (No limit on length).
3. A single Autodesk Inventor image that best represents your robot design
4. A 3-D DWF export of the main robot design
5. Autodesk Inventor dataset – In a single compressed ZIP file, includes all model and drawing files. These include Assemblies, Parts, Drawings, as well as any linked image files, styles, or libraries. Please use the Inventor Pack and Go utility to package up the entire design with all its supporting files. In the past, high-scoring entries have included Drawings, Parts Lists, and Tube & Pipe and Cable & Harness components.

**Please note:** Designs must be created entirely within Autodesk Inventor (any version). 2D and 3D data from **other Autodesk products, such as AutoCAD and Autodesk SketchBook Pro can be imported to Autodesk Inventor as part of the robot design work flow.** Importing geometry from CAD packages other than Autodesk products will significantly impact the team score.

**Please note:** Make sure to include your team number in the file format, such as "team\_xxxx.iam. or team\_xxxx.dwf" (JPG, DWF, Inventor main assembly and ZIP file).

If your entry uses non-Roman characters (such as Hebrew or Cyrillic), please use WinRAR as WinZip will damage the filenames.

## Two: Photographs

In order for the judges to compare both your design intent and evidence of following the design process, and your technical expertise against the final physical robot, your team will need to provide five high quality photos of your final robot with your entry. You will submit these photos with the rest of your entry. These photos should include the following:

- Digital photographs of your completed robot should clearly show the front, rear and side views of your robot.
- Additional photos should show close-ups that emphasize the advantages of your design (i.e. interesting or unique parts of the design). Please describe these advantages in your entry description. (#1)

### Award Requirements - Submission Process:

All submissions will be made through the Autodesk Education Community website at [www.autodesk.com/first](http://www.autodesk.com/first). After the close of deadline and review by Autodesk, you will also be able to view other team's entries on the site.

Complete details on the submission process will be available on Autodesk's Education Community section dedicated to FIRST: [www.autodesk.com/first](http://www.autodesk.com/first) by February 1, 2010.

#### Entry Deadline:

All entries must be submitted with all associated files through the Autodesk Education Community site [www.autodesk.com/first](http://www.autodesk.com/first) not later than Thursday, February 25, 2010, 5:00 p.m. Pacific Standard Time. No entries submitted later than 5:00 p.m. Pacific Standard Time on Thursday, February 25, 2010 will be considered for judging.

#### Judging Process:

The judging panel of volunteers with professional backgrounds in technology, design, education, and robotics will review all entries in this Award Category. Judges are familiar with FRC, with design competitions, and with the application of Autodesk products and other technologies in engineering, design, robotics, and education. Five finalists will be selected by the judge team to advance to a final round judging. The judge team will also judge this final round, and will choose the final Championship winner in its sole and absolute discretion.

This Award Category (3D Design) will be judged in 2010 **only at the Championship** level. It will not be judged at the Regional level. The Winner will be announced by an Autodesk representative, and the winning entry will be shown during The 2010 *FIRST* Robotics Championship Awards Ceremony. Representatives from the winning team will be acknowledged on the main stage if present. The Winner will also be posted and highlighted on the Autodesk Education Community website.

#### Judging Criteria:

In scoring your entry, judges will use specific criteria and will assign a maximum number of points for each criterion on the basis below. The maximum total points possible is 100 points.

- Clear statement of the design problem and evidence of following a design process: 35
- Actual design solution to your stated problem: 20
- Technical expertise in use of Autodesk Inventor: 30
- Presentation: 15

#### **Category Two: Animation**

**Note:** This Award will be judged and presented *at both Regional and Championship levels* in 2010.

#### Purpose of the Award:

This Award Category honors excellence in student animation, including an understanding of the design process, storytelling, technical execution, creativity and aesthetics, and clear, concise, and compelling communication.

The Award recognizes an outstanding 30-second animation that best depicts the 2010 theme outlined below.

This year's theme is: **Change Your World**

Students have a genuine interest in preparing themselves to have a positive impact on their community, society and environment. They want to acquire the knowledge and skills that they can apply to creating positive change, including skills in design and visualization. Creativity, innovation, teamwork, and entrepreneurship are also “must have’s” for those students that will be our future change agents and leaders.

Here is your Animation challenge:

You have the opportunity to identify a current challenge and tell us how your idea/product/invention would change our world – for the better! It might be something that makes a positive difference in the lives of individuals, in your neighborhood, in the world at large, or – even - in space. It may save lives or make daily life easier. It may be the next best thing to clean our oceans, generate power, or sustain & steward our resources. It’s up to you. But you need to clearly state the design challenge you identify; then create a 30-second animation that communicates your solution to meeting that challenge. Of course, if robotics comes into play – that’s great, but not a requirement.

**Award Requirements – Content & Format:**

There are three separate but related required areas of content, and there are required formats for each area of content.

Required elements of content are:

#### 1. Create a storyboard

- Write a brief statement describing the opportunity that you see to Change Your World (50 words, maximum). Identify the challenge you see and how you will meet that challenge.
- Develop a storyboard (no size or length requirement) that clearly communicates the intention you have for your animation, including characters, environments, and storyline.
- **Note:** You can create your storyboard using pencils and capture it by scanning, or you can provide an electronic storyboard that you have developed using a product like Autodesk SketchBook Pro (which is available to you for free\* if you are a member of the Autodesk Education Community at [www.autodesk.com/first](http://www.autodesk.com/first)).

#### 2. Submit a 30-second animation using Autodesk 3ds Max or Autodesk Maya that meets the requirements listed below:

Your 30-second animation must:

- Illustrate this year’s theme
- Meet all entry, file format and deadline requirements
- Be created using Autodesk 3ds Max software, any version. or Autodesk Maya 2010 software. In addition, you can use any other Autodesk product that you have been able to download for free\* as a registered member of Autodesk’s Education Community at [www.autodesk.com/first](http://www.autodesk.com/first)

### 3. Create a .JPEG image

- Your .JPEG image should best represent the most compelling aspect of your animation
- This image will be used on the Autodesk Education Community site to represent your animation

Required elements of format are:

1. Your entry must include: 5-second slate followed by one second of black, followed by the animation of no more than 30 seconds, followed by one second of black. The initial slate must include:

- Team number
- Team Name
- School
- Title
- Duration (not including slate and black)
- Audio (stereo, mono, none) peak not to exceed -6db or fall under -18db
- Credits may follow that still frame, but will not be included as part of the timing, judging or scoring process, and may not be included in the marketing materials used by Autodesk.

#### 2. File format

- Export your finished animation out of Autodesk 3ds Max or Autodesk Maya in QuickTime (.MOV) (see Acceptable Codec below)
- NOTE: The QuickTime export function is included in the Autodesk 3ds Max or Autodesk Maya software. Third party editing software may also be used to assemble the final presentation to add music and narration, etc. The same specs apply for export from those programs.
- NOT acceptable: .wmv .mpg .asp .wmx
- Audio (stereo, mono, none) peak not to exceed -6db or fall under -18db Title safe guidelines: (NOTE: Computer screens are NOT the same as TV screens) All files should be 720 x 480. All text and motion animation within the 720 x 480 window should be 15% away from the edge (especially text) to ensure that your content will fit a TV screen when viewed for judging from a DVD format. Solid or textured backgrounds are OK to run to the edge. Anything on top of the background must follow the Title Safe guidelines. All files should be 720 x 480 and follow these screen guidelines. All files should be 720 x 480

#### 3. Acceptable Codec :

- DV/DVPRO-NTSC ONLY
- Cinepak is NOT acceptable
- Do not use DivX or any other non-standard Codec
- Frame Rate: 29.97 frames per second ONLY
- Frame Size: 720 x 480 ONLY: 640 x 480 & 320 x 240 are NOT acceptable.
- Maximum File Size: Please keep your entry under 250MB

#### 4. File naming convention:

You must name your animation in the following file format:

All of the files should be named using your team number, for instance "team\_0123.mov."

Award Requirements – Submission Process:

All submissions will be made through the Autodesk Education Community website at [www.autodesk.com/first](http://www.autodesk.com/first) . After the close of deadline and review by Autodesk, you will also be able to view other team's entries on the site.

Complete details on the submission process will be available on Autodesk's Education Community section dedicated to FIRST: [www.autodesk.com/first](http://www.autodesk.com/first) by February 1, 2010.

All entries must be submitted with all associated files through the Autodesk Education Community website ([www.autodesk.com/first](http://www.autodesk.com/first)) not later than Monday, February 15, 2010, 5:00 p.m. Pacific Standard Time. No entries submitted later than 5:00 p.m. Pacific Standard Time, Monday, February 15, 2010 will be considered for judging.

#### Judging Process:

The judging panel of volunteers with professional backgrounds in animation, technology, design, and education will review all entries in this Award Category. Judges are familiar with FRC, with design competitions, and with the application of Autodesk products and other technologies in media & entertainment, engineering, design, robotics, and education.

This Award Category (3D Design) will be judged in 2010 at both the Regional and Championship levels. At the Regional level, the judging will be by peers; see details below. At the Championship level, volunteer judges with professional backgrounds will judge. At Championship, the Winner will be announced by an Autodesk representative, and the winning entry will be shown during The 2010 *FIRST* Robotics Championship Awards Ceremony. Representatives from the winning team will be acknowledged on the main stage if present. The Winner will also be posted and highlighted on the Autodesk Education Community website.

#### Judging Criteria:

In scoring your entry, judges will use specific criteria and assign points on the basis outlined below. The maximum number of points possible is 100.

**Note:** Of course, we encourage teams to focus on a concept that they genuinely believe make for positive change in our world. However, the judges will not be scoring on the basis of the merits of the concept, per se. Rather, they will be scoring on the basis of the criteria below which relate to developing a 30-second animation that is designed and that communicates at a distinctive level of excellence.

#### **Concept-to-Completion Excellence (Maximum: 30 points)**

Distinction in the selection of a topic for animation to illustrate and communicate a clearly defined message aligned with this year's theme.

Measured in terms of how well your team:

- Identifies and executes on a concept from storyboard to finished animation
- Organizes the content and imagery for your 30-second animation to tell a complete story and make a

compelling point

- How well your animation flows from your storyboard

### **Creativity (Maximum: 30 points)**

Distinction in design and animation to make your entry visually exciting, arresting, striking and memorable.

Measured in terms of how your team:

- Develops compelling story with content, characters and environments that are memorable
- Incorporates effects, sound, music (non-copyrighted or used with permission), photos, video, and related creative technologies
- Takes a distinctive and compelling approach to the theme
- Captures attention & and stands out from the rest

### **Technical Execution (Maximum: 30 points)**

Distinction in the application of Autodesk software.

Measured in terms of:

- How skillfully your team uses Autodesk 3ds Max or Autodesk Maya to create a technically impressive animation.

Some examples of technical applications are modeling, materials application, lighting, camera motion and angles, sound effects, texture mapping, color, special FX, character animation, editing technique. In addition to using the features of Autodesk 3ds Max, judges will review how well you have incorporated other elements not usually a function of Max or Maya, such as voice-over, music, photography, or live video into the animation.

### **Peer & Professional Perspective (Maximum: 10 points)**

Distinction in being awarded points and positive comments from peers and professionals alike throughout Regional and Championship judging.

NOTE: Animations that use copyrighted music without written permission from the legal copyright owner will be disqualified. All entries that indicate that they are using copyrighted music will be required to provide proof of permission in written format from the rightful owner when they submit their entry. Any disputes about whether or not copyrighted music was improperly used will be addressed by Autodesk, and should illegal use be determined that entry will be disqualified, even if such entry has been selected as an Award winner.

### **Regional Judging:**

There will be peer judging for this Award for the Regional level.

**Here is how the process will work for the regional events:**

1. Submit your animation Entry meeting all Entry requirements by the deadline on Monday February 15, 2010, 5:00 p.m. Pacific Standard Time on [www.autodesk.com/first](http://www.autodesk.com/first) .
2. When your team submits your Entry, you will be asked to designate a single FRC Regional event in which you want your Entry to be judged. Each team will only be able to compete for this Award in that single designated FRC Regional event. Your team must be registered to compete in the robotics competition at that designated Regional.
3. Each team that has submitted an animation for a designated Regional event will be able to participate in peer judging of all other Entries at that Regional. Each participating team will review and cast a single vote for the Award Entries. We recommend that each participating team identify students who have been involved in some way with the development of his/her team's own submittal to lead in the review and vote for Entries.
4. Teams will have access to view and judge the Regional Entries on Autodesk's Education Community ([www.autodesk.com/first](http://www.autodesk.com/first)) prior to the start of regionals, and will be able to cast a vote through the Education Community at any time *but not later than* Midnight (local time, where the Regional competition takes place) on the Thursday of the Regional. This will be the only opportunity for peer judging. If your team does not take the opportunity or meet the deadline for peer judging, you will miss your opportunity to cast your team's vote.
5. In order to participate in peer judging,
  - Your team must be registered and must participate in the designated Regional *FIRST* Robotics Competition that was indicated in your Entry process
  - Teams will not be allowed to score the animation submitted by their own team.
6. One Winner with the highest number of points will be announced at the Friday closing ceremonies of that Regional event and will receive a trophy.
7. All Entries submitted for each Regional event will be shown at the venue on the main screen.
8. Winners will be recognized at each Regional event. Autodesk will post the Regional Award winners on the Autodesk Education Community website. All entries will be posted on the *FIRST* website as well.
9. The Winner selected at the Regional events has no bearing on the finalists or Winners selected for the overall season's Award for Excellence in Design, sponsored by Autodesk, Animation Category.

**SPECIAL NOTICE TO TEAMS PARTICIPATING IN MICHIGAN:**

**The competition for the Award for Excellence in Design, Sponsored by Autodesk, Animation Category will be held at the Michigan State Championship. It will not be held at the district events. Here are the details of how the process will work.**

- Any registered team in Michigan can enter the competition

- Their Entry will be automatically entered into the overall Award for Excellence in Design, Sponsored by Autodesk, Animation Category
- Their Entry will also be judged at the Michigan State Championship whether or not their FRC team is competing at the State Championship
- Peer judging for the Michigan State Championship will work the same as it does for the other FRC Regional events, where a team that has submitted an Animation at a Michigan district event is eligible to view all the animations and cast a single team vote, and the team with the highest score will win the award at the State Championship. Remember, you can vote early, but not later than Midnight Thursday of the event.
- The Winner need not be present to win. The Winner will be acknowledged at the Michigan State Championship awards ceremony and their trophy will be shipped to them if they are not present.