

## Study Guide:

### “The Robotic Chair” (1984 - 2006)

by Max Dean, Raffaello D’Andrea  
and Matt Donovan

**About the artwork:** *Robotic Chair* is an example of kinetic sculpture. It looks like a generic wooden chair - but it suddenly collapses to the floor, throwing its legs, chair back, and seat across the platform.

Then *Robotic Chair* puts itself back together.

The performance takes between 5 and 15 minutes and operates through a robotic mechanism hidden from the viewer.

The design of its platform is such to minimize impact. Fiberglass, carbon fibre and wood veneer make up the chair's materials. It has an aluminum chassis with 14 motors, various electronic components, custom mechanical joints, a wireless radio, wheels, and a battery pack. A video camera and computer help to choreograph the performance, and a computer sits out of view to orchestrate all the dance steps. The artists intentionally chose to design a familiar object - a chair - as it eliminates 'the process of discovery' for the viewer. Several versions of the chair exist, one of which belongs to the National Gallery of Canada.



**About the artists:** This work was a collaboration between three very different artists: Max Dean, Raffaello D’Andrea and Matt Donovan. Max Dean, born in England (1949), lives and works in Toronto. He is a photographer, performance, installation, and kinetic artist. Raffaello D’Andrea, born 1967 in Italy, is an engineer, entrepreneur, and new media artist. D’Andrea is a professor of dynamic systems and control at the Swiss Federal Institute of Technology (ETH) in Zurich. He is also the co-founder of Kiva Systems, now known as Amazon Robotics. Matt Donovan, born in 1974, is an artist and industrial designer based in Toronto, known for his conceptual work in collaboration, and his own intricate 2D and 3D mosaics made of Lego.

**Please preview the short film and then share it with your students. Select one or two guiding questions that reflect your curriculum and can guide student**

## research and inquiry connected to the artwork, artists, and the socio-cultural context in which it was created.

### Guiding Questions:

- How do art and technology intersect?
- How might a familiar object become unfamiliar?
- How does collaboration and process of creating reflect and support a larger concept of resilience?
- The chair is symbolic of resilience. How might you create an artwork, dance, musical composition, or poem to illustrate the concept of resilience?
- What role does time, or duration, play in this artwork?
- Explore the contrast between stillness and motion. How might you create a dance, a song, drama performance, artwork, or new invention that play with the contrast between these two concepts?
- Use dance or drama to embody the collapse & reconstruction of an object.
- How might you compose or arrange new or familiar music to express the notion of dismantling & rebuilding?
- Re-vision an every-day object through the design process to create an element of surprise.
- How might this artwork or its impact change when created as an unfamiliar object?
- Use a digital tool to design a prototype to add a kinetic element to a stationary object.
- Use the stages of research and design to graphically represent the solution to another kinetic object. Begin constructing a prototype inspired by the robotic chair.
- Examine how the principle of duration is present in this artwork.
- This artwork calls into question the role of artist. What are the criteria for artist?
- Create a short narrative that uses the chair as a central object for the theme, plot or conflict.
- Explore how coding and other STEAM skills are used in the design of this artwork.

### Supporting Links:

- [The historical relationship between artistic activities and technology development](#)
- [The Certainty of Machines: An Interview with Max Dean](#)
- [Making the entrepreneurial leap: a Q&A with alumnus and robotics pioneer Raffaello D'Andrea](#)
- [The Robotic Chair: Entropy and Sustainability](#)
- [Max Dean, Raffaello D'Andrea, Matt Donovan, Robotic Chair, 2003-2006, film by Peter Lynch](#)

### Ontario Secondary Curriculum Connections

#### The Arts- Visual Arts

B1. The Critical Analysis Process: demonstrate an understanding of the critical analysis process by examining, interpreting, evaluating, and reflecting on various art works;

B2. Art, Society, and Values: demonstrate an understanding of how art works reflect the society in which they were created, and of how they can affect personal values;

C1. Terminology: demonstrate an understanding of, and use correct terminology when referring

to, elements, principles, and other components related to visual arts;

C2. Conventions and Techniques: demonstrate an understanding of conventions and techniques used in the creation of visual art works;

A1. The Creative Process: apply the creative process to create a variety of art works, individually and/or collaboratively;

A2. The Elements and Principles of Design: apply elements and principles of design to create art works

for the purpose of self-expression and to communicate ideas, information, and/or messages;

### **The Arts - Media Arts**

B1. The Critical Analysis Process: demonstrate an understanding of the critical analysis process by using it to monitor the creative process, and by examining, interpreting, assessing, and reflecting on media art works;

B2. Identity and Values: demonstrate an understanding of how media art works reflect personal and cultural identity, and affect personal, cultural, and community values and their awareness of those values;

C2. Contexts and Influences: demonstrate an understanding of the sociocultural and historical contexts of media arts;

A1. The Creative Process: apply the creative process to create media art works, individually and/or collaboratively;

A2. The Principles of Media Arts: design and produce media art works, applying the principles of media arts and using various elements from contributing arts (dance, drama, music, visual arts);

A3. Using Technologies, Tools, and Techniques: apply traditional and emerging technologies, tools, and techniques to produce and present media art works for a variety of audiences and purposes.

### **The Arts - Dance**

A1. The Creative Process: use the creative process, the elements of dance, and a variety of sources to develop movement vocabulary;

A2. Choreography and Composition: combine the elements of dance in a variety of ways in composing individual and ensemble dance creations;

### **The Arts - Drama**

A1. The Creative Process: use the creative process and a variety of sources and forms, both individually and collaboratively, to design and develop drama works;

A2. Elements and Conventions: use the elements and conventions of drama effectively in creating individual and ensemble drama works, including works based on a variety of sources;

A3. Presentation Techniques and Technologies: use a variety of presentation techniques and technological tools to enhance the impact of drama works and communicate for specific audiences and purposes.

### **The Arts - Music**

A1. The Creative Process: apply the stages of the creative process when performing notated and/or improvised music and composing and/or arranging music;

A2. The Elements of Music: apply elements of music when performing notated and improvised music and composing and/or arranging music;

### **Construction technology (Grade 10):**

B1. design construction projects, individually or in small groups, applying a design process to plan and develop the projects and other problem-solving processes to address various related problems and challenges;

B2. use drawings to represent design ideas and solutions to technological challenges, and interpret drawings accurately when working on construction projects;

B3. apply the mathematical skills required in the planning and building of construction projects.

### **English:**

*Writing:* use a variety of organizational structures and patterns to produce coherent and effective written work;

### **Science (Grade 9, 2023)**

A1. STEM Investigation Skills: apply scientific processes and an engineering design process in their investigations to develop a conceptual understanding of the science they are learning, and apply coding skills to model scientific concepts and relationships

### **Technological Design (Grade 10)**

A1. identify and describe the purpose, scope, and steps of a design process;

A2. identify and describe tools, strategies, and skills needed for project research, planning, and organization;

A3. demonstrate an understanding of how design ideas are represented graphically;

A4. explain the purpose of building models and prototypes, and identify tools, materials, and methods for building and testing them;

A5. demonstrate an understanding of communications methods used in the design process.

B1. research, plan, and organize projects, using a design process and appropriate methods and tools;

B2. apply appropriate methods for generating and graphically representing design ideas and solutions;

B3. create and test models using a variety of techniques, tools, and materials;

B4. use suitable communication methods throughout the design process.

C1. demonstrate an understanding of environmentally responsible practices, and apply them throughout the technological design process;

C2. describe how society influences technological innovation and how technology affects society.

**Writer's Craft:**

- produce writing for a range of purposes and audiences with an emphasis on well-developed content and the effective use of appropriate forms, techniques, diction, voice, and style