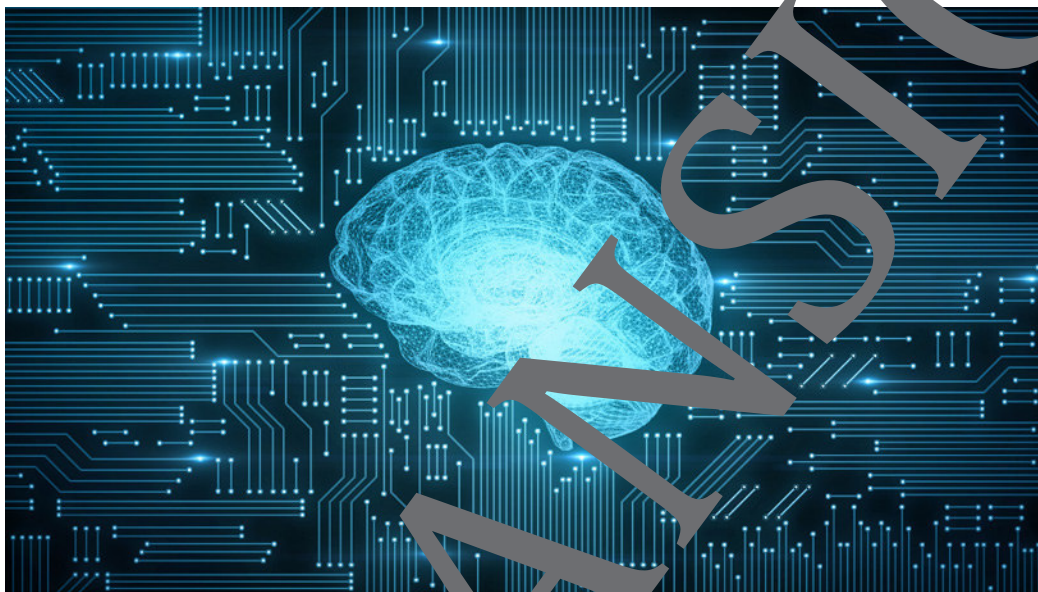


## II.C.8.6

Landeskunde – Science, Technology and Environment

### Wally Pfister's *Transcendence* – anhand des Films Aspekte des Themas „Science and technology: utopia and dystopia“ erarbeiten (S II)

Dirk Beyer, Aachen



Der dystopische Science-Fiction-Blockbuster „*Transcendence*“ thematisiert die Errungenschaften, Möglichkeiten und Grenzen moderner und zukünftiger Technologien. Er setzt sich mit den Vor- und Nachteilen künstlicher Intelligenz und Nanotechnologie auseinander und schafft im Unterricht viele Diskussionsanlässe. Neben einem Schwerpunkt auf die Förderung des Hör-Seh-Verstehens und Sprechens werden ebenfalls digitale Tools in die Unterrichtssequenz integriert.

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#### KOMPETENZPROFIL

**Klassenstufe:** 11/12 (G8), 12/13 (G9)

**Dauer:** 2 Unterrichtsstunden (à 90 Minuten)

**Inhalt:** future worlds, utopia and dystopia, modern technology

**Kompetenzen:** 1. Leseverstehen: Zeitungsartikel und Sachtexte verstehen und zusammenfassen 2. Hör-Seh-Verstehen: einem Film relevante Informationen entnehmen 3. Medienkompetenz: filmtechnische Mittel analysieren, digitale Tools anwenden

**Material:** Videosequenzen, Sachtexte

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## Auf einen Blick

### 1. Stunde

**Thema:** *Transcendence* – introducing the topic

**M 1** ***Transcendence – focus on future technology*** / Erfassen und Diskutieren der Rolle und möglichen Zukunft der Nanotechnologie und deren Bedeutung für die Medizintechnik; Aufbau von Grundlagenwissen

**Homework:** (After the debate:) Write your comment. Alternative: Do task 1 on your own (expert task).

**Benötigt:**  ggf. OH-Projektor, Dokumentenkamera bzw. Whiteboard/Beamer  
 ggf. Folienkopie, Ausdruck bzw. digitale Fassung von M 1

### 2. Stunde

**Thema:** Getting to know *Transcendence* – focus on the trailer and the film poster

**M 2** ***Getting to know Transcendence – station rotation*** / Arbeitsteiliges Erarbeiten der Hintergrundinformationen zum Film mithilfe des Trailers und Filmposters; Identifizieren wichtiger Merkmale utopischer und dystopischer Welten; Vorbereiten des Films (*pre-watching*)

**Benötigt:**  Kopien bzw. digitale Fassungen der Stationen 1–4 je nach Anzahl der Gruppen  
 Smartphone/ Tablet zur QR-Anwendung (Videsequenzen)

### 3. Stunde

**Thema:** *Transcendence* – Dr. Will Caster's introductory speech

**M 3** ***Transcendence – listening and viewing comprehension*** / Überprüfen des Hör-Seh-Verstehens mit anschließender Diskussion ausgewählter Aspekte

**Benötigt:**  ggf. OH-Projektor, Dokumentenkamera bzw. Whiteboard/Beamer  
 ggf. Folienkopie, Ausdruck bzw. digitale Fassung von M 3



#### 4./5. Stunde

**Thema:** *Transcendence* – watching the entire film

**M 4** *Transcendence* – film study worksheet / Unterstützen des Sehverstehens durch Leitfragen; Analysieren filmtechnischer Mittel und Erläutern und Beschreiben ihrer Funktion im Kontext des Films

**Homework:** Have a close look at various film reviews online and add some more details to your list.

**Benötigt:**

- ggf. OH-Projektor, Dokumentenkamera bzw. Whiteboard/Beamer
- ggf. Folienskopie, Ausdruck bzw. digitale Fassung von M 4
- ggf. Endgeräte zur Bearbeitung des *film study worksheet* in Padlet



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#### 6. Stunde

**Thema:** *Transcendence* – utopian, dystopian elements and moral lesson

**M 5** *Transcendence* – utopian, dystopian elements and moral lesson / detaillierte Analyse utopischer und dystopischer Merkmale; Abschlussdiskussion (oder Aufsatz) über den moralischen Wert des Films

**Benötigt:**

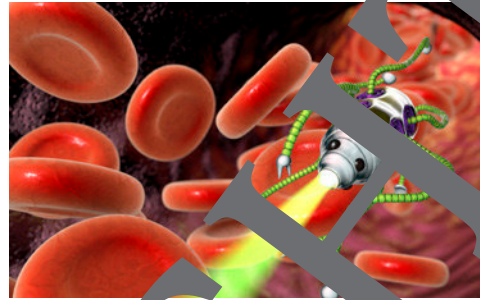
- ggf. OH-Projektor, Dokumentenkamera bzw. Whiteboard/Beamer
- ggf. Folienskopie, Ausdruck bzw. digitale Fassung von M 5

## M 1

## Transcendence – focus on future technology

## The life-saving future of medicine

Nanorobots that ‘eat’ harmful bacteria, viruses and fungi in the blood or replace the chromosomes from diseased cells with a new sets [sic] made outside the patient’s body – what are the limits to nanomedicine? Medica nanorobots will be the size of bacteria, composed of thousands of molecule-sized mechanical parts perhaps resembling gears, bearings<sup>1</sup> and ratchets<sup>2</sup>.



© Dr\_Microbe Stock/Getty Images Plus

They may be composed of a strong, diamond-like material. A nanorobot will need motors to make things move, and manipulator arms or mechanical legs. It will need a power supply, sensors to guide it, and an onboard<sup>3</sup> computer to control its behaviour. But unlike a regular robot, a nanorobot will be smaller than our red blood cells and able to squeeze through our body’s narrowest capillaries<sup>4</sup>.

What will they do? A “microbivore”<sup>5</sup> nanorobot, for example, could act as an artificial white cell, seeking out and digesting germs<sup>6</sup> – bacteria, viruses, or fungi – in the blood. [...] A targeted germ would stick to the nanorobot’s surface, like a fly caught on flypaper. After being gathered into the microbivore’s “mouth”, the germ would be minced up<sup>7</sup> and digested<sup>8</sup> into harmless molecules in just minutes. A complete treatment of this kind might take just a few hours – far faster than the days or weeks often needed for antibiotics to work – and no bacteria would have developed resistance to these machines as they can’t respond to antibiotics. When the nanorobotic treatment is finished, the doctor might broadcast an ultrasound signal to direct the nanorobots to the kidneys<sup>9</sup> where they would be painlessly passed out in the urine. Similar nanorobots could be programmed to quickly recognise and digest even the tiniest clumps of young cancer cells, long before they spread throughout the body. Cancer would no longer threaten our health.

Medical nanorobots could also perform surgery on individual cells. In one proposed procedure, a surgeon-controlled nanorobot called a “chromalloyte” would extract all the chromosomes from a diseased cell and insert new ones in their place. The new chromosomes could have been manufactured outside the patient’s body using a desktop nanofactory. After injection, each nanorobot would travel to its target cell, enter the nucleus and replace the chromosomes, then exit the cell and leave the body. If the patient chooses, inherited<sup>10</sup> defective genes could be replaced with non-defective base-pair sequences, permanently curing many genetic disease and even permitting cancerous cells to be reprogrammed to a healthy state. [...]

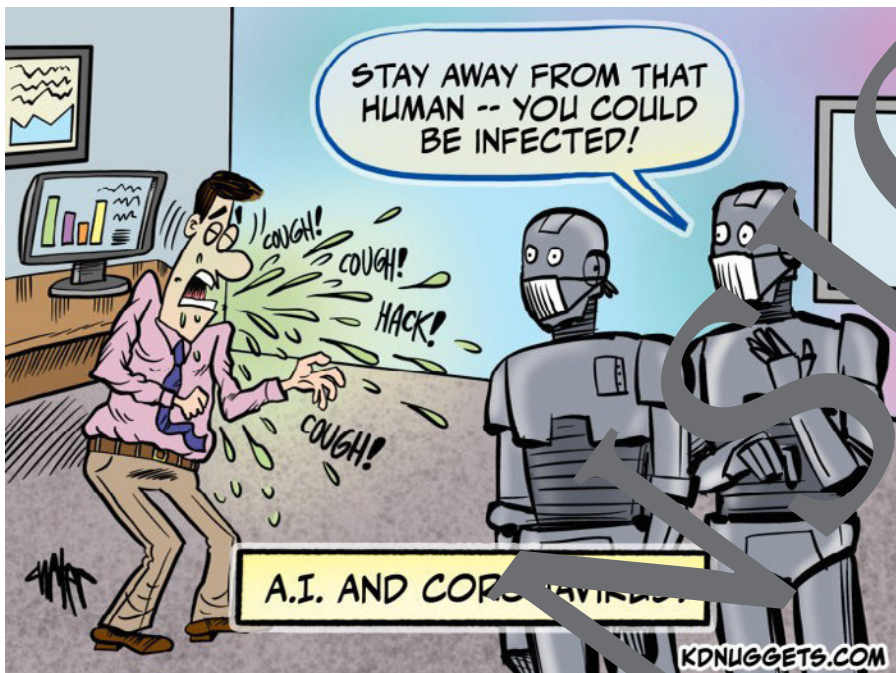
The first experimental proof that individual atoms could be manipulated was obtained by IBM scientists back in 1989 when they used an electron microscope to position 35 individual atoms to spell out the three letters of the company’s logo. Similarly, inside the nanofactory of the future, carbon-rich feedstock molecules such as natural gas, propane, or acetylene will be manipulated by massive, parallel arrays of tiny probes to build the atomically precise diamond-like machine parts needed to assemble medical nanorobots. The Nanofactory Collaboration, a loose-knit community of scientists founded in 2000, is coordinating a research and development programme to design and build the first working nanofactory that could create medical nanorobots ... hopefully within the next 20 years.

Source: Freitas Jr., Robert A.: “The life-saving future of medicine”. In: *The Guardian*. March 28, 2018; found at: <https://www.theguardian.com/what-is-nano/nano-and-the-life-saving-future-of-medicine> [last access: 06/10/2021].

### Station 3 (collaborative group) – focus on ethical views on modern technology

#### Tasks

1. Individual work: Study the cartoon and describe what you can see.
2. Group work I: Outline the positive and negative effects of Artificial Intelligence as portrayed in the cartoon.
3. Group work II: Discuss if you agree or disagree with the benefits of AI as shown in the cartoon.



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#### Language support

- The cartoon clearly shows ... introduces the viewer to ...
- In the middle/foreground/background there are ...
- The cartoon is dominated by ...
- The cartoonist/artist wants to show ... / explain ...
- In my opinion, the cartoon is effective / not effective because ...
- Perhaps the major intention is to show ...

## Transcendence – Dr. Caster’s introductory speech

M 3

You are going to watch the introductory speech by Dr. Will Caster (Johnny Depp) on his project dealing with modern ways of creating and using Artificial Intelligence (AI). Watch the film scene carefully concentrating on aspects related to AI as well as its advantages and disadvantages.



© pick-uppath/DigitalVision Vector Art Images

### Tasks

#### A. Pre-viewing

You are going to watch a short extract from the film *Transcendence*.

1. Before you watch the scene, talk about these questions in class:

- What kind of modern technology do you like? Why?
- What is Artificial Intelligence (AI)?
- Do you have any experience with AI?

#### B. While-viewing

Watch the scene on DVD (8:46–11:00) or at <https://raabe.de/link/SpeechTranscendence> and answer the following questions:

2. What type of film is *Transcendence*? \_\_\_\_\_

#### This list of genres may help you:

comedy – science fiction – action film – animated film – war film – musical – horror film – thriller

3. Choose the heading which best fits the content of the video clip:

- The capacity for reason
- The limits of biology
- The future of Artificial Intelligence

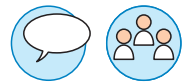
4. Watch the extract again. Use the table below to take notes on the main ideas.

capacity for reason	
Artificial Intelligence (AI)	
future technology	

#### C. Post-viewing

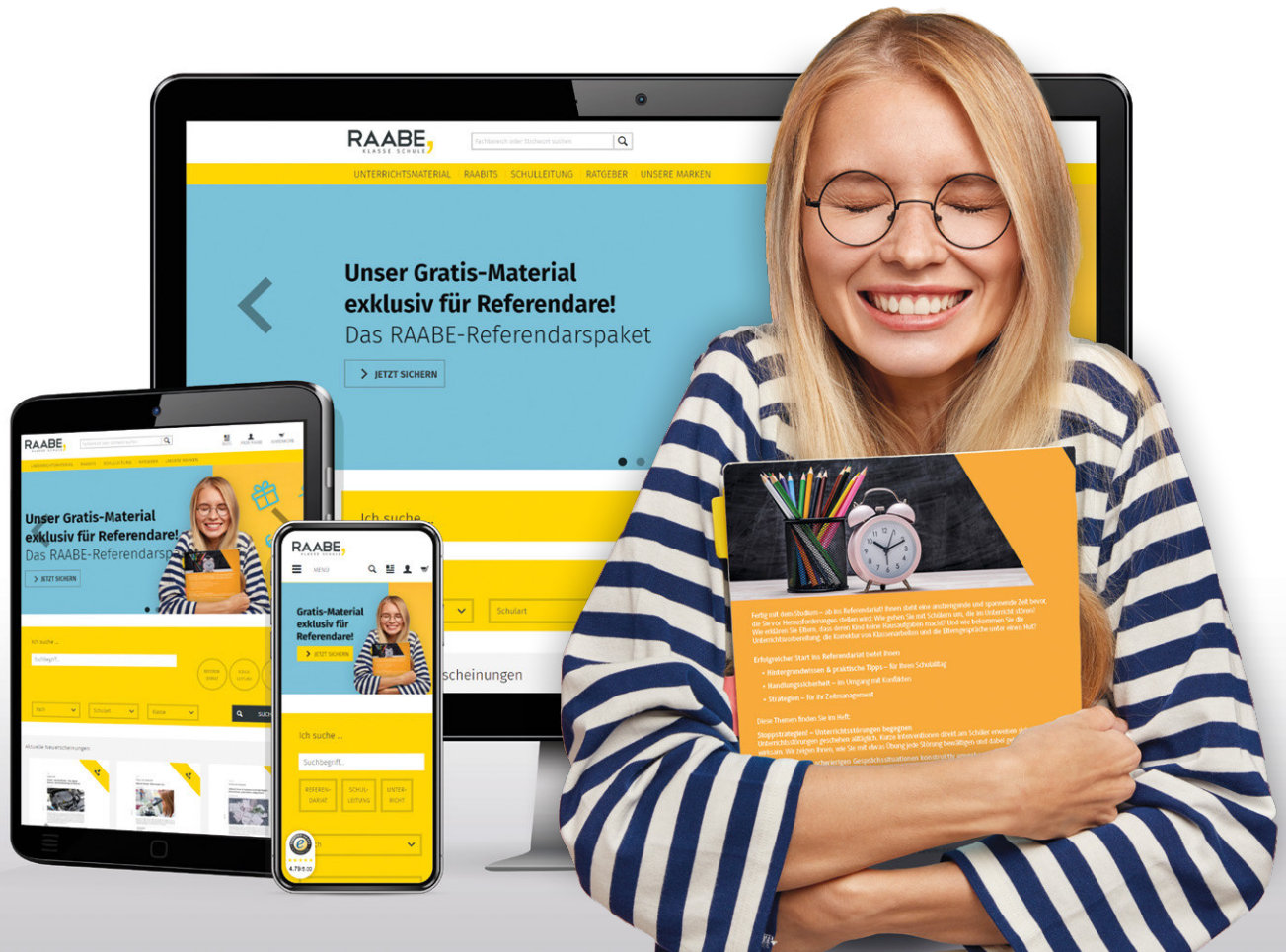
5. Compare your ideas with a classmate. You may watch the extract again if necessary.

6. Discuss with your classmates: Do you agree with the statement that Dr. Will Caster “wants to create his own God”?



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