

Genetics

PAIR WORK: Student A: doc 1 p.140

© 2001 Steve Breen – Copley News Service.



Newsweek, September 16, 2002

15 disturbing. On the positive side, diagnostic tests using gene chips and other technologies may tell us if we're susceptible to specific diseases or how we'll respond to certain drugs. Armed with this information, doctors may be able to tailor our diets and our treatments to our own genetic idiosyncrasies.

1. Find the equivalents (in the right order) of:
 - laboratoire – dépistage/sélection – recherche –
 - proscrire – dévoté/crapuleux – faire des pieds et des mains – troubant – adapter – caractéristique.
2. Explain why genetic technology generates both hope and fear.

Based on what's happening in today's labs, perhaps the biggest Next Big Thing will come from the field of genetics. In vitro fertilization already gives scientists the ability to create an embryo. Should the technology get good enough to make many embryos at once, genetic screening techniques, which already exist, will allow scientists to pick the one with the most highly prized traits. Outlawing eugenics in the United States or Europe won't help much if the technology is being practiced in China. Rogue scientists are even now scrambling to create the first human clone; the event is likely to be

1. So man created man in his own image...

- 5 1° Read document 1- "So man created man in his own image" (p. 140) and answer the two questions in the book.

1- *laboratoire*: lab (l.2) *dépistage/sélection*: screening (l.7) *recherché*: prized (l.10)
proscrire: outlaw (l.10) *crapuleux*: rogue (l.13) *faire des pieds et des mains*: scramble (l.13)
troubant: disturbing (l.15) *adapter*: tailor (l.20) *caractéristique*: idiosyncrasy (l.21)

2- *Hope*: genetic technology can help identify and cure diseases
Fear: genetic technology may become out of control and lead to eugenics and other unethical experiments like human cloning

- 2° Analyse the meaning of the title of this document as well as the cartoon.

Mans plays god, which may be dangerous.

- 3° Prepare notes for a short oral summary of the journalist's point of view: write key words only (no sentence!) and organize your ideas (the pros and cons, for example).

- 4° a- Present your document to your partner.

b- Make sure your partner has understood you: ask him/her questions about what you have said.

Therapeutic cloning

Student B:

1° Read the document and find the equivalents (in the right order) of:
courir partout: tear about (l.1) –
maladie héréditaire: hereditary condition (l.5) –
affaiblir: weaken (l.5) –
les malades: sufferers (l.5) –
fécondation in vitro: IVF (l.10) –
tentative: attempt (l.11) –
se débarrasser de: discard (l.16)

- 2° a- What was Molly's problem?

b- What did her parents decide to do?

c- What did some people think of it? Why?

3° Prepare notes for a short **oral** summary of your article: write key words only (no sentence!) and organize your ideas.

- 4° a- Present your document to your partner.

b- Make sure your partner has understood you: ask him/her to explain in his/her own words what happened to Molly.

Six-year-old Molly Nash tears about the family home near Denver, Colorado – a little girl in a huge hurry. [...] Just over a year ago the same vivacious child was desperately ill in hospital. Molly was born with the genetic disorder Fanconi's anaemia, a rare hereditary condition which weakens the immune system. Sufferers usually succumb to cancer and die by the age of seven. Molly's only hope of survival was a stem-cell¹ transplant. Her parents were told the best way to save their daughter was to have a sibling² who was a perfect tissue match. [...] The Nashes did not hesitate to try to conceive using a combination of IVF and cell selection.

After several unsuccessful attempts, Adam was born in August 2000. Dubbed 'the world's first designer baby' his arrival plunged the family into a debate over ethics. [...] 'Ethics is for the general population. As a mother I would do whatever it takes to save my child,' says Lisa. And Jack, the father, adds 'I would advise parents to do whatever is best for their family. People called us murderers because we discarded foetal cells with Fanconi's anaemia. But at the end of the day, we have two healthy children.'

Daily Mail, October 18th, 2001.

1. *une cellule souche*
2. *un frère ou une sœur*

Genetics

Student A:



Newsweek, September 16, 2002

15 disturbing. On the positive side, diagnostic tests using gene chips and other technologies may tell us if we're susceptible to certain diseases or how we'll respond to certain drugs. Armed with this information, doctors 20 may be able to tailor our diets and our treatments to our own genetic idiosyncrasies.

1. Find the equivalents (in the right order) of:
 - laboratoire – dépistage/sélection – recherche –
 - proscrire – dévoyer/crapuleux – faire des pieds et
 - des mains – troubiant – adapter – caractéristique.
2. Explain why genetic technology generates both hope and fear.

Based on what's happening in today's labs, perhaps the biggest Next Big Thing will come from the field of genetics. In vitro fertilization already gives scientists the ability to create an embryo. Should the technology get good enough to make many embryos at once, genetic screening techniques, which already exist, will allow scientists to pick the one with the most highly prized traits. Outlawing eugenics in the United States or Europe won't help much if the technology is being practiced in China. Rogue scientists are even now scrambling to create the first human clone; the event is likely to be

1. So man created man in his own image...

- 5 1° Read the document and answer the two questions.
- 2° Analyse the meaning of the title of this document as well as the cartoon.
- 3° Prepare notes for a short oral summary of the journalist's point of view: write key words only (no sentence!) and organize your ideas (the pros and cons of genetic technology, for example).
- 4° a- Present your document to your partner.
- 10 b- Make sure your partner has understood you: ask him/her questions about what you have said.

Therapeutic cloning

Student B:

1° Read the document and find the equivalents (in the right order) of: *courir partout – maladie héréditaire – affaiblir – les malades – fécondation in vitro – tentative – se débarrasser de*

2° a- What was Molly's problem?
b- What did her parents decide to do?
c- What did some people think of it? Why?

3° Prepare notes for a short **oral** summary of your article: write key words only (no sentence!) and organize your ideas.

4° a- Present your document to your partner.

b- Make sure your partner has understood you: ask him/her to explain in his/her own words what happened to Molly.

Six-year-old Molly Nash tears about the family home near Denver, Colorado – a little girl in a huge hurry. [...] Just over a year ago the same vivacious child was desperately ill in hospital. Molly was born with the genetic disorder Fanconi's anaemia, a rare hereditary condition which weakens the immune system. Sufferers usually succumb to cancer and die by the age of seven. Molly's only hope of survival was a stem-cell¹ transplant. Her parents were told the best way to save their daughter was to have a sibling² who was a perfect tissue match. [...] The Nashes did not hesitate to try to conceive using a combination of IVF and cell selection.

After several unsuccessful attempts, Adam was born in August 2000. Dubbed 'the world's first designer baby' his arrival plunged the family into a debate over ethics. [...] 'Ethics is for the general population. As a mother I would do whatever it takes to save my child,' says Lisa. And Jack, the father, adds 'I would advise parents to do whatever is best for their family. People called us murderers because we discarded foetal cells with Fanconi's anaemia. But at the end of the day, we have two healthy children.'

Daily Mail, October 18th, 2001.

1. *une cellule souche* 2. *un frère ou une sœur*

GATTACA

I- TRAILER (2:26)

1° Use the key words you understand to sum up the general topic of the movie

2° Fill in the blanks:

“Genetics, what can it mean? *The ability to perfect the physical and mental characteristics of every unborn child.*”

In the not too distant future, our DNA will determine everything about us. A minute drop of blood, saliva, or a single hair, determines where you can work, who you should marry, what you're capable of achieving.

In a society where success is determined by science, divided by the standards of perfection, one man's only chance is to hide his own identity by borrowing someone else's. [...]*

But in a place where any cell from any part of your body can betray you, how do you hide when we all shed 5 hundred million cells a day?

* borrow: emprunter

3° a) In a group of three students, use the information from the trailer to imagine the story of Vincent, the main character of this story.

b) Present your story to two partners from another group. Answer the questions of your partners.

II- FILM: Chapter 3 (8:41 - 10:35): Vincent's conception and childhood

1° Listen for key words describing the way children were conceived in the past: *child conceived in love has greater chance of happiness/ god's hands/ten fingers ten toes/*

In the present: *not any more/local geneticist/time and cause of my death known at birth*

2° Complete:

They used to say that a child conceived in love has a greater chance of happiness. They don't say that anymore. Ten fingers, ten toes, that's all that used to matter. Not now. Now, only seconds old, the exact time and cause of my death was already known.

3° a) Match Vincent's health condition with the right probability:

Neurological condition= 60% probability; Manic depression=42% probability; Attention deficit disorder 89% probability; Heart disorder= 99% probability;

b) How many years is Vincent expected to live? *life expectancy= 30.2 years*

c) What will probably be the cause of his death? *He may die of a heart attack.*

4° Consequences of this health analysis on his childhood:

a) How does his mother react when Vincent falls? Why?

b) Why does the headmistress refuse to take Vincent in her school?

c) Imagine his future life, keeping in mind what you have learnt in the trailer: type of job, family life...

III – Text Chapter 4 (10:35- 11:10)/ Text p.141 : At the geneticist

1° Watch the beginning of the scene then open your books p.141 and read the text.

2° What differences will there probably be between Vincent and his future brother (conception, physical appearance, health, future life...)? Use words from the toolbox page 143.

3° a) List all the physical, psychological or social aspects of the future child's identity that can be chosen by the geneticist.

b) Which aspects would you like to be able to control for your own child? Explain why. Do you believe some aspects should not be controlled at all? Which one(s)? Explain why.

4° What aspects of gene manipulation are denounced here? (*financial aspect, not completely reliable, nothing left to chance or nature: everything is planned*)

5° a) Analyse the characters' reactions and attitudes (pay attention to the stage directions).

b) Focus on lines 10 to 33: with 2 partners choose a role and practise reading your part aloud with the appropriate tone. Repeat to get better.

6° Watch the scene in the movie.

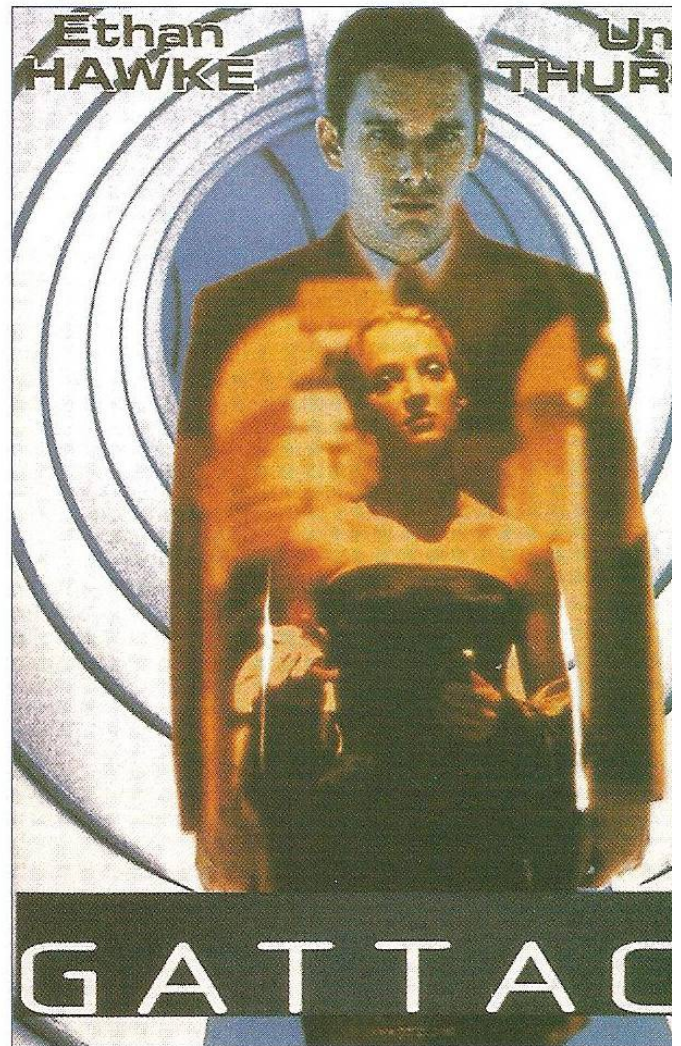
60 **GRAMMAR:** 3 p.144 Talking about the future

IV- MESSAGE of GATTACA: Watch the message: explain its meaning and react.

Can you tell, by looking at the poster, what kind of film *Gattaca* is? What can you guess about the relationship between the two characters?

Read the phonetic transcription of these keywords: [dʒɪˈnetɪsɪst] – [ˈembriəʊ] – [dɪˈzɪz], then imagine what the story is about.

Human possibilities



- GENETICIST:** Your extracted eggs... *(noting the couple's names from data along the edge of the screen)* Maria, have been fertilized with... Antonio's sperm and we have performed an analysis of the resulting pre-embryos.
- 5 After screening we're left with two healthy boys and two healthy girls. Naturally, no critical pre-dispositions to any of the major inheritable diseases. All that remains is to select the most compatible candidate.
- Maria and Antonio exchange a nervous smile.*
- 10 **GENETICIST:** First, we may as well decide on gender. Have you given it any thought?
- MARIA** *(referring to the toddler on her knee):* We would like Vincent to have a brother... you know, to play with.
- The geneticist nods. He scans the data around the edge of the screen.*
- 15 **GENETICIST:** You've already specified blue eyes, dark hair and fair skin. I have taken the liberty of eradicating any potentially prejudicial conditions – premature baldness, myopia, alcoholism and addictive susceptibility, propensity for violence and obesity –
- MARIA** *(interrupting, anxious):* We didn't want – diseases, yes.
- ANTONIO** *(more diplomatic):* We were wondering if we should leave some things to chance.
- 20 **GENETICIST** *(reassuring):* You want to give your child the best possible start. Believe me, we have enough imperfection built-in already. Your child doesn't need any additional burdens. And keep in mind, this child is still you, simply the best of you. You could conceive naturally a thousand times and never get such a result.
- ANTONIO** *(squeezing Maria's hand):* He's right, Maria. That's right.
- 25 *Maria is only half-convinced, but the geneticist swiftly moves on.*
- GENETICIST:** Is there any reason you'd want a left-handed child?
- ANTONIO** *(blank):* Er, no...
- GENETICIST** *(explaining):* Some believe it is associated with creativity, although there's no evidence. Also for sports like baseball it can be an advantage.
- 30 **ANTONIO** *(shrugs):* I like football.
- GENETICIST** *(injecting a note of levity¹):* I have to warn you, Mr Freeman, he's going to be at least a head taller than you. Prepare for a crick in the neck² in sixteen years time.
- Antonio beams proudly.*

GENETICIST (*scanning the data on the screen*): Anything I've forgotten?

35 **MARIA** (*hesitant about broaching the subject*): We want him – we were hoping he would get married and have children. We'd like grandchildren.

GENETICIST (*conspiratorial smile*): I understand. That's already been taken care of. (*an afterthought*) Now you appreciate I can only work with the raw material I have at my disposal but for a little extra... I could also attempt to

40 insert sequences associated with enhanced mathematical or musical ability.

MARIA (*suddenly enthused*): Antonio, the choir...

GENETICIST (*interjecting, covering himself*): I have to caution you it's not fool-proof. With multi-gene traits there can be no guarantees.

ANTONIO: How much extra?

45 **GENETICIST**: It would be five thousand more.

Antonio's face falls.

ANTONIO: I'm sorry, there's no way we can.

GENETICIST: Don't worry. You'll probably do just as well singing to him in the womb. (*rising to end the appointment*) We can implant the most

50 successful pre-embryo tomorrow afternoon.

Maria is staring at the four magnified clumps³ on the screen.

MARIA: What will happen to the others?

GENETICIST (*reassuring*): They are not babies, Maria, merely "human possibilities"... smaller than a grain of sand.

Andrew NICCOL, *Gattaca* (1997)

1. levity: *légèreté* – 2. crick in the neck: *torticolis* – 3. clump: *amas*.

1 Understanding the text

What suggestions does the geneticist make to Maria and Antonio? Your *workbook* will help you answer this question and others.

2 Going further

1. Imagine what had happened before this scene took place.
2. Make a physical description of the child Maria and Antonio are likely to have.
3. Analyse the parents' reactions throughout the scene.
4. What aspects of gene manipulation are denounced here?
5. Do the advantages of gene manipulation outweigh the risks?

3 Phonologie

Entraînez-vous à bien faire **les liaisons** à l'aide de votre *workbook*.

4 Enrichissez votre vocabulaire

Réviser le lexique lié à la **santé** et aux **maladies**. Vous trouverez des exercices dans votre *workbook*.



Andrew NICCOL was born in New Zealand in 1964. He began his career in London, successfully directing TV commercials before moving to Los Angeles. He actually made his screenwriting and directing debut with *Gattaca*, a sci-fi movie that raised issues of genetic engineering in a totalitarian environment.

Toolbox

Nouns: gene [dʒi:n] – fertilization [fɜːtɪlaɪ'zeɪʃən] – manipulation – DNA [di:en'eɪ] • alcoholic – drug addict – shortcoming *défait* • feature ['fi:tʃə] *caractéristique* – skill *compétence* – ability – eugenics [ju:'dʒenɪks].

Adjectives: in vitro • bald [bɔːld] *chauve* – short-sighted *myope* – sterile • perfect = *flawless* – healthy • tense – ill-at-ease • delighted = *elated* [ɪ'leɪtɪd] • upset *contrarié* – downhearted • out of control – unpredictable *imprévisible* – risky = *hazardous*.

Verbs and expressions: procreate – give birth to • prevent sb/sth from V-ing – avoid *éviter* • expect – foresee *prévoir* • play God/with fire – endanger = jeopardize [ˈdʒepədaɪz] • afford to *se permettre*.

I- GATTACA: The trailer

Fill in the blanks:

“..... what can it mean ? The ability to perfect the
and characteristics of every unborn”

5 In the not too distant future, our will everything about us. A
minute drop of,, or a single,
determines,,

In a where is determined by,

10 by the standards of, one man's is
to his own by borrowing* someone else's. [...]

But in a place where from of your
can you, how do you when we all
shed ?

15 * borrow: emprunter

a) In a group of three students, use the information from the trailer to imagine the story of Vincent, the main
character of this story.

b) Present your story to two partners from another group. Answer the questions of your partners.

20

II- GATTACA: The film Vincent's conception and childhood

1° Listen for key words describing child conception and birth

25 in the past:

in the present:

2° Complete:

30 They that a child has a greater
..... . They don't say that

Ten, ten, that's all that Not now. Now, only seconds old,
the of my was

3° a) Match Vincent's health condition with the right probability:

35 Attention deficit disorder ⌚ 42% probability

Neurological condition ⌚ 40 60% probability

Manic depression ⌚ 89% probability

Heart disorder ⌚ 99% probability

b) How many years is Vincent expected to live?

c) What will probably be the cause of his death?

45

4° Consequence of this health analysis on his childhood:

a) How does his mother react when Vincent falls? Why?

b) Why does the headmistress refuse to take Vincent in her school?

c) Imagine his future life, keeping in mind what you have learnt in the trailer: type of job, family life...

50

GATTACA: Text p.141 At the geneticist

1° Watch the beginning of the scene then open your books p.141 and read about what happens after.

55 2° What differences will there probably be between Vincent and his future brother (conception, physical
appearance, health, future life...)? Use words from the toolbox page 143.

3° a) List all the physical, psychological or social aspects of the future child's identity that can be chosen by the
geneticist.

b) Which aspects would you like to be able to control for your own child? Explain why. Do you believe some
aspects should not be controlled at all? Which one(s)? Explain why.

60 4° What aspects of gene manipulation are denounced here?

5° a) Analyse the characters' reactions and attitudes (pay attention to the stage directions).

b) Focus on lines 10 to 33: with 2 partners choose a role and practise reading your part aloud with the
appropriate tone. Repeat to get better.

65

GRAMMAR: 3 p.144 Talking about the future

Expression du futur:

WILL	BE GOING TO
Hypothèse ou certitude sur l'avenir (pas de nuance particulière) <i>Ex : John and Sara will bring the wine</i>	Hypothèse ou certitude sur l'avenir (à partir d'indices présents) <i>Ex : Look, the teacher is going to have a baby !</i>
Décision prise sur-le-champ <i>Ex : - Who wants to do the dishes ? - Well, I'll help you if you want.</i>	Décision réfléchie/déjà prise <i>Ex : I'm going to buy the groceries, do you need anything ?</i>

5 Translate, using WILL or BE GOING TO:

- a. D'accord, d'accord, **j'irai** demain je te le promets.
OK, OK, tomorrow I promise.
- b. **Je vais le faire**, je te l'ai déjà dit !
....., I've already told you!
- c. J'ai pris un crédit parce que **je vais acheter** une voiture.
I've taken out a loan because
- d. Tu aimes cette bague ? Alors **je vais te l'acheter** !
Do you like that ring? Then.
- e. Attention, tu **vas tomber** !
Careful,
- f. Je pense qu'il **va chanter**.
I think
- g. **Je le ferai** la semaine prochaine.
.....
- h. Tu as vu le ciel ? Il **va neiger**.
Have you seen the sky?

Expression du futur:

WILL	BE GOING TO
Hypothèse ou certitude sur l'avenir (pas de nuance particulière) <i>Ex : John and Sara will bring the wine</i>	Hypothèse ou certitude sur l'avenir (à partir d'indices présents) <i>Ex : Look, the teacher is going to have a baby !</i>
Décision prise sur-le-champ <i>Ex : - Who wants to do the dishes ? - Well, I'll help you if you want.</i>	Décision réfléchie/déjà prise <i>Ex : I'm going to buy the groceries, do you need anything ?</i>

10 Translate, using WILL or BE GOING TO:

- a. D'accord, d'accord, **j'irai** demain je te le promets.
OK, OK, tomorrow I promise.
- b. **Je vais le faire**, je te l'ai déjà dit !
....., I've already told you!
- c. J'ai pris un crédit parce que **je vais acheter** une voiture.
I've taken out a loan because
- d. Tu aimes cette bague ? Alors **je vais te l'acheter** !
Do you like that ring? Then.
- e. Attention, tu **vas tomber** !
Careful,
- f. Je pense qu'il **va chanter**.
I think
- g. **Je le ferai** la semaine prochaine.
.....
- h. Tu as vu le ciel ? Il **va neiger**.
Have you seen the sky?