

© International Baccalaureate Organization 2022

All rights reserved. No part of this product may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without the prior written permission from the IB. Additionally, the license tied with this product prohibits use of any selected files or extracts from this product. Use by third parties, including but not limited to publishers, private teachers, tutoring or study services, preparatory schools, vendors operating curriculum mapping services or teacher resource digital platforms and app developers, whether fee-covered or not, is prohibited and is a criminal offense.

More information on how to request written permission in the form of a license can be obtained from <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organisation du Baccalauréat International 2022

Tous droits réservés. Aucune partie de ce produit ne peut être reproduite sous quelque forme ni par quelque moyen que ce soit, électronique ou mécanique, y compris des systèmes de stockage et de récupération d'informations, sans l'autorisation écrite préalable de l'IB. De plus, la licence associée à ce produit interdit toute utilisation de tout fichier ou extrait sélectionné dans ce produit. L'utilisation par des tiers, y compris, sans toutefois s'y limiter, des éditeurs, des professeurs particuliers, des services de tutorat ou d'aide aux études, des établissements de préparation à l'enseignement supérieur, des fournisseurs de services de planification des programmes d'études, des gestionnaires de plateformes pédagogiques en ligne, et des développeurs d'applications, moyennant paiement ou non, est interdite et constitue une infraction pénale.

Pour plus d'informations sur la procédure à suivre pour obtenir une autorisation écrite sous la forme d'une licence, rendez-vous à l'adresse <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organización del Bachillerato Internacional, 2022

Todos los derechos reservados. No se podrá reproducir ninguna parte de este producto de ninguna forma ni por ningún medio electrónico o mecánico, incluidos los sistemas de almacenamiento y recuperación de información, sin la previa autorización por escrito del IB. Además, la licencia vinculada a este producto prohíbe el uso de todo archivo o fragmento seleccionado de este producto. El uso por parte de terceros —lo que incluye, a título enunciativo, editoriales, profesores particulares, servicios de apoyo académico o ayuda para el estudio, colegios preparatorios, desarrolladores de aplicaciones y entidades que presten servicios de planificación curricular u ofrezcan recursos para docentes mediante plataformas digitales—, ya sea incluido en tasas o no, está prohibido y constituye un delito.

En este enlace encontrará más información sobre cómo solicitar una autorización por escrito en forma de licencia: <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

**Design technology**  
**Higher level**  
**Paper 3**

Wednesday 9 November 2022 (morning)

Candidate session number

1 hour 30 minutes

--	--	--	--	--	--	--	--	--	--

**Instructions to candidates**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[40 marks]**.



### Section A

Answer **all** questions. Answers must be written within the answer boxes provided.

- 1. Standard hand gloves do not work on touchscreens.

Swipegloves have developed gloves that allow users to interact with their touchscreens without having to take their gloves off, see **Figure 1**. Swipegloves introduced touchscreen gloves in 2022 with a retail price of US\$9.99. **Figure 2** shows a user interacting with a touchscreen.

**Figure 1: Example of touchscreen gloves**



**Figure 2: Swipegloves can be used with touchscreens**



- (a) List **two** possible user-centred design (UCD) strategies that might have been used in the design and development of the Swipegloves.

[2]

.....

.....

.....

.....

(This question continues on the following page)



12EP02

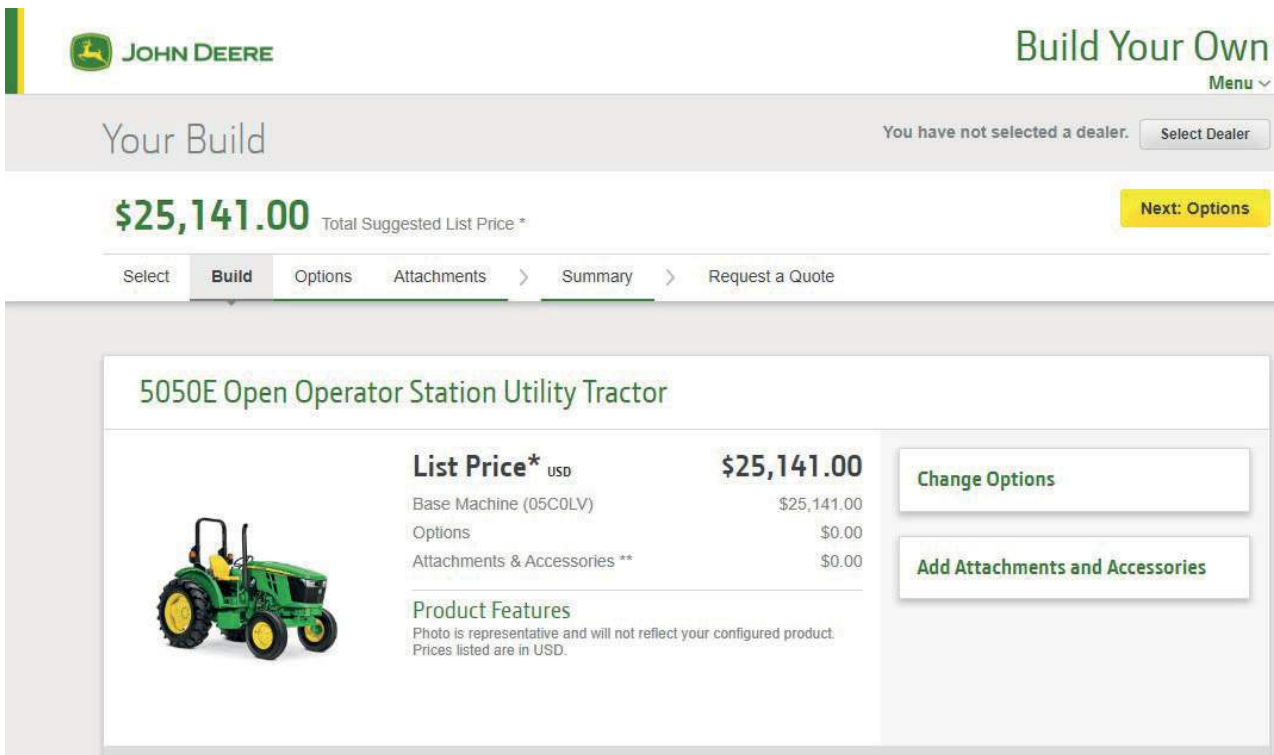


- 2. John Deere manufactures equipment used in agriculture, construction and forestry. To improve productivity and customer satisfaction, the company updated its quality management, implemented lean production and outsourced all machinery operations to third party suppliers.

John Deere have also introduced the “Build Your Own” option, where customers can select a supplier, customize their equipment and calculate the total price before placing their order. Customers have said that this option provides good value for money.

**Figure 3** and **Figure 4** show the John Deere website and user interface which shows how a tractor can be customized.

**Figure 3: “Build Your Own” utility tractor page**



[Image Provided as Courtesy of John Deere]

(This question continues on the following page)



12EP04

(Question 2 continued)

Figure 4: "Build Your Own" summary page showing the total price with customized attachments and accessories

The screenshot displays the 'Your Summary' page for a John Deere 5050E Open Operator Station Utility Tractor. The total suggested list price is \$25,243.64. The price breakdown is as follows:

Category	Price
Base Machine	\$25,141.00
Attachments & Accessories	\$102.64
Options	\$0.00
<b>Total</b>	<b>\$25,243.64</b>

The 'Attachments & Accessories' section is expanded to show the following items:

Attachment Name	Quantity	Price
<b>ATTACHMENTS FOR FIELD CONVERSION</b>		
<b>Horn Kit</b> For use on 5045E, 5055E, 5065E, and 5075E tractors Compatible with OOS tractors only	1 x	\$52.80 ea
<b>Rear View Mirror Mounting Kit OOS</b> Requires AL80127 and/or AL80126. OOS Only. Kit contains support plates and hardware for one rear view mirror. Mirror not included.	1 x	\$49.84 ea

[Image Provided as Courtesy of John Deere]

- (a) List **two** of the 7 wastes of lean production that companies such as John Deere aim to eliminate.

[2]

.....

.....

.....

.....

(This question continues on page 7)



12EP05

Turn over

Please **do not** write on this page.

Answers written on this page  
will not be marked.



12EP06

**(Question 2 continued)**

- (b) Outline how John Deere's "Build Your Own" option provides customers with value for money. [2]

.....

.....

.....

.....

- (c) Outline how John Deere's "Build Your Own" is an example of a just in time (JIT) production strategy. [2]

.....

.....

.....

.....

- (d) Explain how John Deere can use quality assurance to ensure clients receive what they ordered. [4]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



12EP07

Turn over



## Section B

Read the case study. Answer the following question. Answers must be written within the answer boxes provided.

3. To encourage sustainable consumption, the company, Sprintkind use only natural and recycled materials in the production of its shoes, socks and clothing.

Sprintkind products are manufactured from materials such as superfine wool, sugarcane, and fibres from Forest Stewardship Council (FSC) certified trees. This results in lightweight, odour free and temperature-regulating products. These materials are available in a limited range of natural colours, see **Figure 5**.

To meet their long-term goal of becoming a carbon-neutral company, Sprintkind began to use a Carbon Count label. **Figure 6** shows the Carbon Count label used to inform consumers of the low carbon footprint. Furthermore, as part of its sustainability objectives, Sprintkind also donates their shoes to charity.

**Figure 5: Sprintkind’s tree fibre, superfine wool and sugarcane shoes**



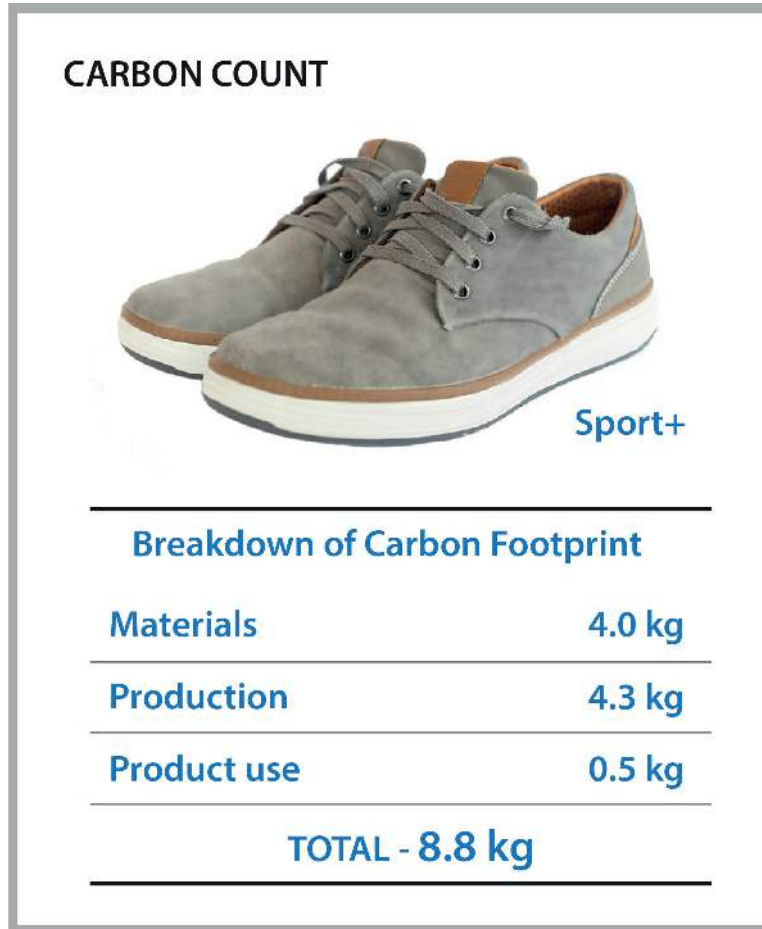
(This question continues on the following page)



12EP08

(Question 3 continued)

Figure 6: Sprintkind's shoe Carbon Count label



(a) List **two** ways that Sprintkind demonstrates corporate social responsibility. [2]

.....

.....

.....

.....

(This question continues on the following page)



12EP09

Turn over





**Disclaimer:**

Content used in IB assessments is taken from authentic, third-party sources. The views expressed within them belong to their individual authors and/or publishers and do not necessarily reflect the views of the IB.

**References:**

**Figure 3** Image Provided as Courtesy of John Deere.

**Figure 4** Image Provided as Courtesy of John Deere.

**Figure 5** Mens Shoes. Image by Marco Verch. [www.flickr.com/photos/30478819@N08/50395873783](http://www.flickr.com/photos/30478819@N08/50395873783). Under copyright and licensed under the Attribution 2.0 Generic license. <https://creativecommons.org/licenses/by/2.0/>. (Image cropped and recoloured).

**Figure 6** Mens Shoes. Image by Marco Verch. [www.flickr.com/photos/30478819@N08/50395873783](http://www.flickr.com/photos/30478819@N08/50395873783). Under copyright and licensed under the Attribution 2.0 Generic license. <https://creativecommons.org/licenses/by/2.0/>. (Image cropped and recoloured).

All other texts, graphics and illustrations © International Baccalaureate Organization 2022



12EP12