GENERAL RULES

VERSION: DECEMBER 1ST

WRO
WORLD ROBOT OLYMPIAD™

WRO INTERNATIONAL PREMIUM PARTNER

LEGO education

Indholdsfortegnelse

Updates on the general rules from 2022 to 2023

The main changes in the general rules from 2022 > 2023 are listed here:

Regel 3.4	Ny regel vedr. opsætning af stand.
Regel 7.11	Forslag om at holdene får certificater: Participation, Bronze, Silver, Gold.
Kapitel 8	New chapter 8 on the judging process and the International Final
Regel 9.3	Information on Bronze, Silver, Gold certificates at International Final.

De her beskrevne regler gælder ved alle internationale WRO events. Nationalt er man velkommen til at tilpasse reglerne til lokale forhold.

Der kan forekomme rettelser til reglerne i løbet af året. Disse findes i givet fald på:
https://wro-association.org/competition/questions-answers/

Del 1 – GENERELLE REGLER

1. General information

Introduktion

I WRO Future Innovators kategorien skal holdene udvikle en robot, der skal hjælpe med at løse problemer i det virkelige liv. Hvert år vælges et nyt tema, der som oftest er forbundet til et eller flere af FN's bæredygtighedsmål. Holdet undersøger en problemstilling indenfor årets tema og udvikler en robotløsning, der kan afhjælpe denne problemstilling.

Fokusområder

Hver WRO kategori har fokus på forskellige læringsmål. I WRO Future Innovators kategorien, er fokus på følgende området:

- Research og udvikling: identifcer et konkret problem indenfor årets tema, undersøg det og udvikl en kreativ løsning.
- Prototyping: omsæt ideerne til en fungerende robotløsning.
- Teknisk ingeniør kunnen: implementere en robotløsning ved at bruge forskellige grundteknikker (kontrollers, motorer, sensorer, 3rd party udstyr etc.).
- Software ingeniør kunnen: udvikle en kode, der understøtter roboløsningen (f.eks. brug af sensorer og samspillet mellem de enkelte komponenter).

- Innovation: Indtænk brugerne i løsningen, hvilken betydning har løsningen for brugeren og hvordan kan prototypen videreudvikles til en reel løsning.
- Præsentationsteknik: Lav en udstilling og præsenter ideen til dommere og publikum.
- Teamwork, kommunikation, problemløsning og kreativitet.

Der bedømmes alderssvarende
Holdene bedømmes ud fra en række kriterier indenfor tre hovedområder. Indenfor hvert hovedområde vægtes bedømmelserne lidt forskelligt afhængig af alderstrinnet (f.eks. er der mere fokus på selve præsentationen for de yngre elever, mens der for de ældre elever lægges mere vægt på innovation og teknisk kunnen)

Det vigtigste er læring

I WRO ønsker vi at inspirere deltagerne til at interessere sig for teknologi og naturvidenskab – og vi ønsker at det foregår med en legende tilgang i konkurrencerne. Derfor er følgende aspekter meget vigtige i WRO konceptet:

- Lærere, forældre og andre voksne må gerne hjælpe, vejlede og inspirere holdene, men de må ikke deltage direkte aktivt i at bygge og programmere robotterne.
- Hold, vejledere og dommere skal acceptere vores WRO Guiding Principles og WRO Ethics Code, der opfordrer alle til at forpligte sig til en fair og meningsfuld læringsoplevelse.
- I en konkurrence skal alle hold og vejledere rette sig efter dommernes afgørelser og være med til at sikre en fair konkurrence

Mere information om WRO Ethics Code her: https://wro-association.org/wp-content/uploads/2021/08/WRO-Guiding-Principles-and-Ethics-Code-2022.pdf.

2. Definition på hold og aldersgrupper ved internationale konkurrencer

Bemærk: *I en dansk sammenhæng arbejder vi ikke strengt med alder, men med klassetrinene svarende til Indskoling, mellemtrin, udskoling og ungdomsuddannelser, således at alle i en klasse kan være med i samme konkurrence uanset alder. Dog skal vi respektere de officielle aldersgrupper ved evt. deltagelse i en international konkurrence.*

2.1. Et hold består af to eller tre deltagere.
2.2. Et hold har en vejleder.
2.3. En deltager og en vejleder kan ikke udgøre et hold.
2.4. Et hold kan kun stille op i en WRO kategori pr år.
2.5. En deltager må kun deltager på et hold pr.år.
2.6. Ved en international finale skal vejlederen være mindst 18 år gammel.
2.7. Vejledere må gene vejlede flere hold.
2.8. Aldersgrupperne i Future Innovators ved internationale konkurrencer er:
  2.8.1. Mellemtrin: 8-12 år (i 2022: skal man være født mellem 2010-2014)
  2.8.2. Udskoling: 11-15 år (i 2022: skal man være født mellem 2007-2011)
  2.8.3. Senior/ungdomsuddannelser: 14-19 år (i 2022: skal man være født mellem 2003-2008)
2.9. Det er deltagerens alder ved årets slutning der gælder og ikke deres alder på selve konkurrencetidspunktet.

3. Ansvarlighed og holdets arbejde

3.1. Alle hold skal deltage på en fair made og opføre sig respektfuldt overfor andre hold, vejledere og dommere og arrangører. Når man deltager i WRO accepterer man WRO Guiding Principles som: https://wro-association.org/wp-content/uploads/2021/08/WRO-Guiding-Principles-and-Ethics-Code-2022.pdf
3.2. Alle deltagere (hold og vejledere) skal underskrive WRO Ethics Code..
3.3. Holdet skal selv bygge og programmere robotten. Vejlederen skal ledsage holdet samt støtte og vejlede dem, men må ikke aktivt bygge og programmere robotten Dette gælder både ved forberedelserne og under selve konkurrencen.
3.4. Udsmykning af stand og præsentation af projektet i standen skal designes og udføres af holdet, ikke af holdlederen eller andre voksne. Holdlederen eller andre voksne må kun hjælpe eller vejlede omkring tekniske problemer, som holdet måtte have når de forbereder standen (gælder særligt de yngre deltagere). Vi forventer en mere professional udsmykning fra de ældre deltagere end fra de yngre deltagere. Dommerne medtager i bedømmelsen af holdene, om udstilling og præsentation leveres på et aldersvarende niveau.
3.5. Hvis man overtræder nogen af reglerne nævnt i dette dokument, så kan dommerne beslutte, at det får en eller flere af følgende konsekvenser. Før det sker, kan holdet eller et enkelt medlem af holdet blive interviewet for at afklare en evt. overtrædelse af

reglerne. Dette kan indebære spørgsmål om robotten eller programmet.

3.5.1. Holdets point kan nedsættes med op til 50% i en eller flere bedømmelsesrunder.

3.5.2. Holdet kan diskvalificeres helt fra konkurrencen med øjeblikkelig virkning.

4. Opgavebeskrivelser og generelle regler

4.1. Hvert år udgiver WRO nye opgavebeskrivelser for hver aldersgruppe og en ny version af de generelle regler. Reglerne anvendes ved alle Internationale WRO events.

4.2. I løbet af året udgiver WRO Question & Answers (Q&As) der kan uddybe, udvide eller omdefinere reglerne i opgaverne og i de generelle regler. Alle bør læse disse Q&As før konkurrencen.

4.3. De nationale opgavebeskrivelser, de generelle regler og Q&As kan være forskellige fra de internationale. Hold, der kvalificerer sig til en international event bør orientere sig om hvorvidt der er forskelle mellem de nationale og de internationale regler.

4.4. I konkurrecen har opgavebeskrivelser og generelle regler flg. status:

4.4.1. De generelle regler er udgangspunktet for kategorien.

4.4.2. Questions & Answers (Q&As) kan ændre i opgavebeskrivelsen eller i de generelle regler.

4.4.3. Under konkurrencen har dommeren til enhver tid det afgørende ord i alle beslutninger og afgørelser.

5. Robotløsning & udstillingsstand

5.1. Holdet skal udvikle en robotløsning der er indenfor årets tema (se PART 3). En robotløsning har følgende karakteristika:

5.1.1. Løsningen er en robotenhed med adskillige mekanismer, sensorer og aktuatorer og den styres med en eller flere kontrollere. En robot skal kunne mere end blot en maskine, der bare gentager bestemte bevægelser, og den skal være i stand til at foretage automatiserede beslutninger.

5.1.2. Selve løsningen kan bestå af en eller flere robotenheder. Hver enkelt robot skal fungere automatiseret og må ikke styres via en kontrolenhed. Der må kun anvendes en remote controller hvis denne har en funktion i relation til omgivelserne som f.eks. publikum. Hvis der anvendes flere robotter, skal de fortrinsvis kommunikere med hianden (digital eller mekanisk).

5.1.3. Løsningen skal være innovative og skal hjælpe mennesker i dagligdagen. De kan erstatte dele af de opgaver mennesker udfører eller gøre det muligt at udføre opgaver der ellers ikke var mulige at udføre. Holdet skal altid oveveje hvilken betydning og indvirkning det vil have for mennesker og omgivelser hvis robotter indgår i et samarbejde med mennesker eller helt erstatter menneskene.

5.1.4. Den robot løsning, der præsenteres, kan være en model af hvordan robotten ville se ud i virkeligheden. Dog skal en evt. model kunne demonstrere så virkelighedsnært som muligt i forhold til hvis den ville være i rigtig produktion. Dette gælder særligt for de ældre elever.

5.2. Der er ingen krav til eller begrænsninger for hvilke kontrollere, motorer, sensorer eller andet materiale, som holdet anvender til deres robotløsning og udstillingsbås. Det bemærkes dog, at det ikke er et formal i sig selv at anvende så meget materiale som muligt. Dommerne vil basere deres bedømmelse på selve projektideen sammenholdt med at materialer mm er anvendt meningsfyldt.

5.3. Valg af software og programmeringssprog til kodning af løsningen er frit. Al kode skal naturligvis være udført af holdet selv og skal være frit tilgængeligt for alle (f.eks. gratis open source værktøjer).

5.4. Holdet skal præsentere deres projekt i en udstillingsbås eller andet område, der har same dimensioner for alle deltagere. Den international standard for en udstillingsbås er 2m x 2m x 2m (selvom de vægge/flader der stilles til rådighed er større). Hvert hold har 3 vandrette flader til rådighed i udstillingsbåsen eller så tæt på som muligt. robotløsningen og alle udstillingsgenstande og udsmykninger skal kunne være i udstillingsbåsen – i modsat fald foretages der ingen bedømmelse.

5.5. For at kunne forklare deres ideer og løsninger til publikum bør holdet bruge udstillingsbåsen til forklarende plancher mm foruden at kunne vise løsningen frem og mundtligt forklare den. Det kan f.eks. være informationer om holdets medlemmer, hvad viser deres research, hvordan har de udviklet løsningen etc.) Der er ingen krav til, hvordan udstillingen laves.

5.6. En komplet demonstration af robotløsningen skal kunne foretages i udstillingsbåsen. Holdet selv må gerne befinde sig udenfor (foran) udstillingsbåsen når de præsenterer/demonstrerer.

5.7. Holdet har mulighed for at bruge et bord i udstillingsbåsen (ca. 120cm x 60cm) Hvis holdet bruger bordet skal det kunne være inde i båsen. Holdet har også mulighed for at få 3 stole i båsen.

5.8. Af sikkerhedshensyn må der ikke anvendes ild eller tåge. Hvis der er brug for at anvende væsker, så check venligst med arrangørerne om dette er muligt før konkurrencen). Brug af væsker er muligvis begrænset til vand og der kan også være begrænsninger for hvor meget væske der kan brugs. Overvej om evt. væsker kan erstattes af andre materialer eller videoer, i det tilfælde at alle væsker ikke er tilladte at anvende.

5.9. Et hold må gerne videreudvikle deres projekt fra et tidligere år. I så fald skal holdet klart og tydeligt forklare og beskrive hvordan projektet adskiller sig fra det tidligere projekt og hvordan det er en videreudvikling.

6. Supplerende materiale

6.1. Overordnet set, er bedømmelsen af et projekt baseret på selve robotløsningen, demonstrationen og præsentationen heraf OG følgende supplerende mteriale:

6.1.1. Projekt rapport (se 6.4).

6.1.2. Projekt video (se 0).

6.2. Projekt videoen er kun relevant ved international events.

RESTEN AF BESKRIVELSERNE UNDER PKT. 6 – 7 OG 8 ER KUN RELEVANTE FOR DELTAGELSE I INTERNATIOANEL EVENTS , OG DERMED KUN RELEVANTE FOR ET FÅTAL DELTAGERE OG ER DERFOR IKKE OVERSATTE.

6.3. Additional materials must be submitted before the competition day, giving the judges enough time to prepare. The competition organizer will announce the submission deadline. For the International WRO Final, all materials must be submitted electronically. On the competition day the team should bring a minimum of 2 printed project reports, one to hand over to the judges and viewing copy for interested visitors.

6.4. The **project report** has the following requirements:

Goal	Help the judges understand the project and prepare questions for the judging session.
Maximum number of pages	20 pages single sided (10 pages double sided), including attachments, not including front-page, table of contents and list of sources. Longer reports will not be judged and will result in a score of zero points.
File type	PDF
Maximum file size	15 MB
Content structure	• Team introduction and roles (max. 1 page) • Summary project idea (max. 1 page) • Presentation of the robotic solution (max. 12 pages including photos of your robotic solution and/or screenshots from the coding): ○ Evolution of project idea during the preparation ○ Research into similar ideas that are available (if any) ○ Construction of the solution ○ Coding of the solution ○ Challenges during the development process • Social impact & innovation (max. 6 pages): ○ Impact of your solution on (local/global) society (include possible negative effects) ○ One tried, practical use case of your idea ○ Junior & Senior age group only: Answer the other questions for this area that are asked in the scoring sheet for these age groups. *IMPORTANT NOTE: For the Elementary age group the chapter about the robotic solution should be max. 15 pages, the chapter on social impact & innovation max. 3 pages.*
Language	For the WRO International Final, the report must be done in English.
Expectation	The project report should be made by the team only, not by the coach or others. A coach or others may only help or guide in any technical issues that teams have while preparing the report (especially for younger kids). We expect a more professional style of document, language and wording from older students than from younger students. Judges will consider whether the report is delivered at a level appropriate to the age of the team when scoring.
Template	A project report template is added to this document (Part 3)

6.5. The **project video** has the following requirements:

Goal	Present the team and the robotic solution to the general public. Demonstrate how the robotic solution works. The video is also a guide for the judges, it gives you some extra time to present your robot solution.
Maximum length of the video	90 seconds (1.5 minutes).
File type	.avi, .mpeg, .wmv, .mp4
Maximum file size	100 MB
Goal	**In the video the team shows their robotic solution while it is running. The team can do this in the real-world environment.** The team should not repeat everything they have written in the report. Teams should briefly introduce themselves and the project idea, but the main part of the video should show how the robotic solution works.
Language	For the WRO International Final, the video must be done in English. (English subtitles can be used to help with understanding, but these are optional.)
Expectation	The video should be done by the team, not by the coach or others. A coach or others may only help or guide with regard to any technical issues that teams have while preparing the video (especially for younger students). Judges will consider whether the video is delivered at a level appropriate to the age of the team when scoring. Please note: Judges do not expect a professional video production. It is completely acceptable if teams just use a mobile device (e.g. smartphone, tablet) to capture the video in one go.

7. Presentation & Judging

7.1. Teams in this category need to go through the following process on the competition day:
- 7.1.1. Setting up their project booth and testing of the robotic solution
- 7.1.2. Inspection of the booth (e.g. check for booth size)
- 7.1.3. Presentation of the robotic solution in one or multiple judging sessions (see 7.2).

7.2. Each judging session takes 10 minutes. Judges will form groups of 2-3 judges and visit teams at their booth. First, the team has 5 minutes to present the project idea and demonstrate the robotic solution live at the project booth. Judges will keep time and stop the team after 5min. Then, judges will ask questions about the project and the robot solution.

7.3. In general, teams must maintain a presence within the team's booth during competition hours in order to present to members of the general public but, of course, the team should take a look at other projects and ideas as well.

7.4. A team should inform themselves of the schedule of the competition day and should be present at their booth in time for a judging session. The team must make sure that the booth is ready, and the robotic solution is on stand-by for a live presentation before the judges arrive.

7.5. If a robotic solution does not function during a judging session the judges will see if they can come back at a later time and/or the team can demonstrate the solution in the next judging session.

7.6. For the WRO International Final, the language for the presentation is English. If a translation is necessary, this should be done by someone without a direct connection to the team (e.g. a National Organizer). Use of translation applications is allowed to translate incidental words/phrases. For competitions in countries, National Organizers can decide on the language.

7.7. The judging at the International WRO Final will be executed in the different age groups with the appropriate scoring sheet for each age group. This will result in there being winning teams for each age group. At WRO Friendship Invitationals all teams can be judged together as one group if not enough teams are available to judge in the different age groups. National Organizers can decide the same for national competitions.

7.8. Judges will prepare themselves for the competition by reviewing the report and video. In addition, at least one judging meeting will take place in the morning of, or the days before the competition. Here, the judges will discuss the judging process and will align on a joint understanding of the scoring sheets.

7.9. Judges should not judge teams from their own school / institution or country. If not enough judges are available, other judges from the judging group will ask the questions to the team during the judging session.

7.10. Judges will always view the performance of the team during the judging session and on the full competition day. Judges can deduct points on situations outside of a judging session as well, e.g. if the judges see that the coach is doing the work of a team.

7.11. It is suggested, that every participant receives a participation, bronze, silver and gold certificate based on their performance based on the following table (see below).

% of maximum points in age group	Certificate
< 25%	Participation
25-50%	Bronze
50-75%	Silver
> 75%	Gold

8. Judging process at the International Final

Note: This chapter may be replaced by a National Organizer with information about the format and ranking of teams at local events and at a National Final in a country.

8.1. The WRO International Final is a two-day event. On the day before, teams can setup the booths and judges use the opportunity to do a judge meeting and to have the same understanding of the process and scoring.

8.2. Judges are divided in groups of 2 or 3 persons. The groups are mixed looking at the level of judging experience, country of origin and professional background.

8.3. **Judging Phase 1:** Teams are judged several times by different judging groups. Not every judging group can see a presentation of every team, because there are multiple judging groups at the event. It is avoided that judges see teams from their own country.

8.4. **Judging Phase 2:**

8.4.1. All scores of all judging groups will be entered in the WRO Scoring System. Then the average scoring of all judges for a team will be used to determine the first ranking.

8.4.2. The first ranking will be discussed in a judge's deliberation round. The top teams (pending on the total amount of teams) from the ranking proceed to judging phase 3. All judges have the right to propose other teams that they feel should proceed to judging phase 3 as well. A judge will need to give relevant arguments for this proposal. Any proposals for extra teams will be discussed, if needed there will be a vote.

8.5. **Judging Phase 3:** The number of points received in round 1 is not the only factor in this phase. All teams in the top group are looked at with a fresh eye. Guided by the age group head judge all teams are discussed again in the judges meeting. Information from the judging groups is shared, the team documentation and video are considered again and if needed teams will be visited by a judge group again to get additional information.

8.5.1. Based on the points received in phase 2 and the thorough discussion described above, the final ranking of the top teams is determined by the judges. The process for this is as follows:

8.5.2. The judges decide on the final ranking of the top teams.

8.5.3. In order to reflect this final ranking in the scoring system certain teams will receive correction points so they end up in the right place in the final ranking.

8.6. The final ranking of the judging is published after the event in the WRO Scoring System. The teams can see the final score that is the average of all judges plus potential a little correction score from the judge's deliberation

9. Awards and recognition at International Final

9.1. At the WRO International Final a 1st, 2nd and 3rd place are awarded to the teams that overall score best in their age group.

9.2. In addition, there will be a number of specific awards that will be presented to teams at the WRO International Final. These are awarded based on the assessment of the judges of an age group (or all judges of the competition), independent of the overall scoring of the teams. Specific sponsor awards can be added as well.
National Organizers can decide to use the same award in their countries or award different awards that are in line with the spirit of our WRO competition.

Additional Awards WRO International Final		
Age group	**Award name**	**Description**
Elementary	Team Spirit Award	This trophy goes to a team that has demonstrated the best team spirit during the presentation and/or competition day(s).
Junior	Technical Solution Award	This trophy goes to a team that presents a truly robotic solution that is both simple and innovative and that is only as complex as is necessary.
Senior	Start-Up Idea Award	This trophy goes to a team that has clearly positioned their project as a prototype for further development. The project idea is innovative and new and will have a positive impact on society.
All age groups	Project Report Award	This trophy goes to a team that has documented their work well and designed their report in such a way that it is interesting and easy to understand for outsiders.
All age groups	Team Award	This trophy goes to the team that got the best score from voting that teams have done among each other. The competition organizer will organize this award with the teams and can decide if this is an award for every age group, only one age group or all age groups.
All age groups	LEGO® Education Creativity Award *(special award for international final only)*	This trophy goes to a team that shows creativity in the presented solution, the build of their robot and/or the presentation of their project. The winning team is selected by LEGO® Education.

9.1. Every team/participant at the international final will receive a bronze, silver or gold certificate based on the points they have received. The exact procedure for awarding these certificates will be shared with teams before the International Final.

PART 2 – Pointgivning

Nedenfor ses de pointskemaer der bruges ved international events.

Dommerne bliver bedt om at vægte alle bedømmelseskriterierne på en skala fra 0 til 10. Baseret på vægtningen udregnes holdets point. Max point fremgår af skemaet.

Ved international events arbejder dommerne sammen to og to eller i mindre grupper. Hvert hold bedømmes af mindst to dommergrupper. Hver dommer bedømmer individuelt og vinderne finds på baggrund af pointgivningen OG en afsluttende drøftelse blandt alle dommerne.

I en dansk sammenhæng står det arrangørerne frit for at vælge andre bedømmelseskriterier

Hvis man ønsker at anvende de officielle bedømmelsesskemaer, så vær opmærksom på, at der er forskellige skemaer til hhv. mellemtrin (Elementary), udskoling (Junior) og ungdomsuddannelserne (Senior).

Dommerne bedømmer hvert kriterie ud fra en skala fra 0 -10 og disse omregnes så til point. F.eks. hvis der gives 5 for Ide, kvalitet og kreativitet i Elementaryskemaet så svarer det til 15 point (5/10 * 30)

WRO Future Innovators - Elementary

	Criteria	Score 0-10*	max points
PROJECT & INNOVATION	**Idea, Quality & Creativity**		**30**
	Research & Report		**15**
	Usage of the idea		**15**
	Key Innovation & Slogan		**10**
	TOTAL		*70*
ROBOTIC SOLUTION	**Robotic Solution**		**30**
	Meaningful use of engineering concepts		**10**
	Code Efficiency & Software Automation		**10**
	Demonstration of Robotic Solution		**15**
	TOTAL		*65*
PRESENTATION & TEAM SPIRIT	**Presentation & Project booth**		**30**
	Technical Understanding & Quick Thinking		**15**
	Team Spirit		**20**
	TOTAL		*65*
	Maximum Points		**200**

Comments:

** Judges give a score from 0-10. For example, if a judge scores "Idea, Quality & Creativity" with a 5, then the team will get 5/10 * 20 = 10 points for this criterion.*

WRO Future Innovators - Junior

	Criteria	Score 0-10*	max points
PROJECT & INNOVATION	**Idea, Quality & Creativity**		**30**
	Research & Report		**15**
	Social Impact & Need		**10**
	Key Innovation & Slogan		**10**
	Extra element of entrepreneurship a) Cost structure, b) Revenue Stream, c) Key Resources, d) Partners		**10**
	TOTAL		*75*
ROBOTIC SOLUTION	**Robotic Solution**		**30**
	Meaningful use of engineering concepts		**15**
	Code Efficiency & Software Automation		**10**
	Demonstration of Robotic Solution		**15**
	TOTAL		*70*
PRESENTATION & TEAM SPIRIT	**Presentation & Project booth**		**25**
	Technical Understanding & Quick Thinking		**15**
	Team Spirit		**15**
	TOTAL		*55*
	Maximum Points		**200**

Comments:

** Judges give a score from 0-10. For example, if a judge scores "Idea, Quality & Creativity" with a 5, then the team will get 5/10 * 30 = 15 points for this criterion.*

WRO Future Innovators - Senior

	Criteria	Score 0-10*	max points
PROJECT & INNOVATION	**Idea, Quality & Creativity**		**20**
	Research & Report		**15**
	Social Impact & Need		**10**
	Key Innovation & Slogan		**10**
	Extra element of entrepreneurship a) Cost structure, b) Revenue Stream, c) Key Resources, d) Partners		**10**
	Next Steps & Prototype Development		**10**
	TOTAL		*75*
ROBOTIC SOLUTION	**Robotic Solution**		**30**
	Meaningful use of engineering concepts		**15**
	Code Efficiency & Software Automation		**10**
	Demonstration of Robotic Solution		**15**
	TOTAL		*70*
PRESENTATION & TEAM SPIRIT	**Presentation & Project booth**		**25**
	Technical Understanding & Quick Thinking		**15**
	Team Spirit		**15**
	TOTAL		*55*
	Maximum Points		**200**

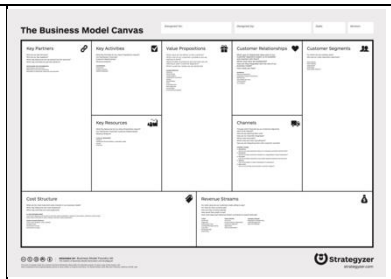
Comments:

** Judges give a score from 0-10. For example, if a judge scores "Idea, Quality & Creativity" with a 5, then the team will get 5/10 * 30 = 15 points for this criterion.*

PART 3 – TEMPLATE PROJECT REPORT

Krav til format gælder kun til internationale events

- PDF, max 15 MB
- Max. 20 pages single sided (10 pages double sided), including attachments, not including front-page, table of contents and list of sources.
- *Please note: longer reports cannot be taken into consideration for the judges scoring!*

	Elementary	*Junior/Senior*
Front page		
Table of Contents		
Team presentation	*max. 1 page*	*max. 1 page*
Let us know a bit more about your team. Who are in the team? Where are you from? How have you divided the tasks in the team? Add a picture of your team.		
Summary project idea	*max. 1 page*	*max. 1 page*
Describe your project and solution in an "executive summary". If someone would only Share all the information your readers and important stakeholders need to know. What is the problem your project is solving and why did you choose this problem? How is the robotic solution going to solve the problem you established? What is the value of your robotic solution? What would happen if it would be used in real life? Why is your project important?		
Presenting robotic solution	*max. 15 pages*	*max. 12 pages*
Describe your robotic solution and how you have developed it. General aspects: How did you come up with this idea? What other ideas did you investigate? Did you find similar ideas being available? What is different about your solution? Technical aspects: Describe the mechanical construction of the solution Describe the coding of the solution Did you face any challenges during the development process?		
Social impact & Innovation	*max. 3 pages*	*max. 6 pages*
Describe the impact of your solution for society. Who will it help? How important is it? Give a concrete example of how/where your idea could be used.(Think about who would use and ow many people would benefit from it.)		
Junior & Senior age group only: Describe more about the innovation and entrepreneurship aspects of your project (see scoring criteria). You could use the concept of a business model canvas to explain aspects of your project as a start-up idea. It is not important that you fill all parts of this canvas, you could only fill the parts where you feel they are most relevant for your project. https://en.wikipedia.org/wiki/Business_Model_Canvas		
List of sources		
Make a list of the documents and – reliable - websites you have used for your research and the people you have spoken with.		

Part 3 - Judging criteria WRO Future Innovators

The judges will look at different aspect of your project and your robotic solution. They will also look at the way you present yourself as a team.

In this document we explain the different topics on the scoring form. You can use this document for your preparations, but please make sure that you also read the official general rules and the season challenge!

Project & Innovation

Idea, Quality & Creativity

Your project should connect to the season theme and to the challenge as described in the season rules. *(Described in part 3 of the General Rules & Season Theme document.)* Your robotic solution should help solve one or more of the problems that are connected to the season theme. Creative thinking is important in your project, so try to find a new approach and think of new ways to solve the problem. The design of your solution should also be innovative and imaginative. Can you think of new uses for materials and resources? Think outside the box!

Research & Report

Before you can build your robotic solution, you need to do research. Which problem do you want to solve and how? You will also do research to find out the best way to build your robotic solution. What materials will you be using? What is the best way to program your robot solution? Talk to other people to find out what they think of your idea. You will produce a report that is a documentation of the development of your project and the research you have done. *(Check article 6.4 of the General Rules & Season Theme document.)*

Usage of the idea (Elementary teams)

You should think about who would use your robotic solution. Who would be helped with your idea? Talk to at least two (2) other people about your idea. (Not your coach or parents) What do they think about it? Do they have some good tips for you?

Social Impact & Need (Junior & Senior teams)

You should think about who would use your robotic solution. Who would be helped with your idea? What is the (social) impact of your idea? Is it important for individuals or for your community or country? Would it benefit people from other countries too? Discuss your idea with at least three (3) other people to get further input. (Not your coach or parents)

Key Innovation & Slogan

You should be able to explain what is unique about your idea. Are there potential competitors? What makes your idea better? You should also present a slogan about your idea - something that will help the public remember your robotic solution.

(Junior & Senior teams only) Extra element of entrepreneurship

You need choose one of the following aspects to explain your idea further.

a) Cost structure: Explain which costs are associated with producing and developing a real prototype of your idea.
b) Revenue Stream: Explain how you could generate income through offering your idea to the market. It could be a social business model as well.
c) Key Resources: Explain what key resources are needed to work on your prototype (e.g. staff, materials, know-how etc.).
d) Partners: Explain what partners are needed to make your idea a reality (e.g. local partners, institutions, investors, etc.).

(Senior only) Next Steps & Prototype Development

You need to present the logical next steps that are needed to develop your idea into a real prototype/product. Think of what you would need to do in the next 6-18 months. You can choose to use the Lean Start-up approach and present how your idea can be rolled-out in this way. For more information visit: https://en.wikipedia.org/wiki/Lean_startup. (But you can also use a different approach.)

Robotic Solution

Robotic Solution

Your robotic solution should have several mechanisms, sensors and actuators and is operated with one or more controller(s). It should be able to do more than a machine that is only repeating a certain workflow as it should make autonomous decisions. Your robotic solution can replace certain parts of human tasks or make it possible to do things we could not do before. *(Check item 5.1 of the General Rules & Season Theme document for the definition of a robotic solution.)*

Meaningful use of engineering concepts

You need to use (technical) materials and components in a sensible and efficient way. Your robotic solution should be well constructed. You should show proper use of engineering and mechanical concepts/principles, for example, in the way you build your robotic solution or use gears, pulleys or levers. You should be able to explain the choices you made.

Code Efficiency & Software Automation

Your robot solution should use inputs from sensors/controllers to run specific routines in a smart and appropriate way. The automation and logic should make sense for your project idea and should be structured and functional. You should be able to explain your code and explain why you have used certain routines and programming languages.

Demonstration of Robotic Solution

You need to demonstrate your robotic solution and it should be reliable. This means that the demonstration can be repeated multiple times. You should be able to explain how the solution works and what could be improved in the future. Your robotic solution is a prototype - not everything will be perfect. If an error happens during the demonstration, you will have an opportunity to solve it or you need to be able to explain why the error happened.

Presentation and Team Spirit

Presentation & Project booth

You need to present your project to the judges in an interesting 5-minute presentation. This presentation should include the demonstration of your robot solution. Your project video is an addition to this presentation and judges will view the video before the judging. *(Check article 6.5 of the General Rules & Season Theme document.)* You should also decorate your booth in such a way that it is informative and attractive to the public. People that visit your booth should be able to get clear information about your project and robotic solution. You can use all kinds of materials to make your project booth look interesting. (Do remember that the goal is to present your robotic solution, not to have the best decorations…)

Technical Understanding & Quick Thinking

You need to be able to explain why and for who your project idea is relevant, how your robot solution works and how you have developed and coded it. You will explain this in your presentation, but you also need to be able to answer questions about your project. This way you demonstrate that you have a good understanding of your solution.

Team Spirit

As a team you show that you value each other's work and the different team roles you have defined for yourself during preparation for the tournament. You are enthusiastic about sharing your idea with others. You also show that you can work on your own, without help from adults, not only during your project, but also when installing your booth or solving technical problems.