Let $L = \{\langle M \rangle \mid \exists w \in \Sigma^*$ such that when M runs on w, M prints a blank on a non-blank cell$\}$

WTS: L is undecidable
$\implies HALT \leq_{\text{m}} L$

Consider the following TM F and the reudction it computes:
$F =$ "On input $\langle M,\ w \rangle$:
  1. Construct a TM M_1 as follows:
    $M_1 =$ "On input $\langle M,\ w \rangle$:
      1. for $s = 1$ to ∞
      2.   run M on w for s steps
      3.   if M writes a blank on a non-blank cell then accept"
  2. Construct a TM M_2 as follows:
    $M_2 =$ "On input x:
      1. $\triangleright$ empty Part1
      2. run M_1 on $\langle M,\ w \rangle$
      3. accept"
  3. return $\langle M_2 \rangle$"

We argue that $\langle M,\ w \rangle \in HALT \iff \langle M_2 \rangle \in L$

($\implies$)
Suppose $\langle M,\ w \rangle \in HALT$

	M halts on w	[definition of $HALT$]
$\implies$	M_2 accepts $\langle M,\ w \rangle$ such that M prints a blank in a non-blank cell	[description of M_2]
$\implies$	$\mathcal{L}(M_2) = \{\langle M \rangle \mid \exists w \in \Sigma^*$ such that when M runs on w, M prints a blank on a non-blank cell$\}$	
$\implies$	$\langle M_2 \rangle \in L$	[definition of L]

as wanted.

($\impliedby$)
Suppose $\langle M,\ w \rangle \notin HALT$

	M loops on w	[definition of $HALT$]
$\implies$	M_2 loops on every input	[description of M_2]
$\implies$	$\mathcal{L}(M_2) \neq \{\langle M \rangle \mid \exists w \in \Sigma^*$ such that when M runs on w, M prints a blank on a non-blank cell$\}$	
$\implies$	$\langle M_2 \rangle \notin L$	[definition of L]

as wanted.